§2. İşlemler

Test 1.

1) $a \blacktriangle b = x$

$\sqrt{a} + \sqrt{b} = x$

2) * abcd

$a + c = x \quad b + d = y$

$\overline{xy}$

3) • vurma işarəsidir.

4) * 251 = ?

$(2 \cdot 5) - 1 = ?$ $\quad ? = 9$

5) $\sqrt{98 + 45} = ?$ $\quad ? = 12$

6) $a \circledcirc b = x$

8) $\frac{10 \cdot 9}{3} = 30$

9) $(10 \cdot 2) - 1 = 19$

10) ■ $73 = 7^2 - 3 = 46$.

• $46 = 4 \cdot 6 = 24$

11) [redacted]

$\Delta 315 \longrightarrow 3 \cdot 5 ; 1$.

$\Delta 315 \longrightarrow 151$.

$\Delta 725 \longrightarrow 7 \cdot 5 ; 2$

$\Delta 725 \longrightarrow 352$

$\Delta(\Delta 925) \longrightarrow \Delta(9 \cdot 5 ; 2)$

[redacted]

$\Delta 452 \longrightarrow$ [redacted] $4 \cdot 2 ; 5$

$\Delta(452) = 85$

12) $a \blacktriangle b = x \qquad a \cdot b = x$

14) $a @ b = x$

$a + 2b = x$

15) $a \bullet b = x$

$\frac{a+b}{2} = x$

16) $a \bullet b = x$

$\frac{a+b}{3} = x$

17) $61 + 70 = 131$ $\quad 1+3+1 = $ (5)

18) $a @ b = x$

$3a - 2b = x$

19) $a @ b = x$

$a^2 - b = x$

20) $(2 \cdot 8) - (8 \cdot 1) = 8.$

$(3 \cdot 7) - (7 \cdot 2) = 7$

Test 2

1) $\triangle 512 = 5+1+2 = 8.$

$\blacktriangle 54 = 5 \cdot 4 = 20$

$\blacktriangle(\triangle 325) = \blacktriangle(3+2+5) = \blacktriangle 10 =$

$= 1 \cdot 0 =$ (0)

2) $\square 54 = 5+4 = 9.$

$\blacksquare 5 = 5^2 = 25$

$\square(\blacksquare 11) = \square(11^2) = \square 121 = 1+2+1 =$

$=$ (4)

3) $a \blacktriangle b = x$

$a^b = x$

4) $\blacktriangle 122 = (1+2; 2) = (3; 2)$ birləşdir $= 32.$

$\blacktriangle 531 = (5+3; 1) = (8; 1)$ birləşdir $= 81.$

5) $a \blacktriangle b = x$
$a^2 - b = x$

6) $a \circ b = x$
$(a \cdot b) - a = x$

7) $a \square b = x$
$(a+b) \cdot 3 = x$

8) $a @ b = x$
$2a + b = x$

9) $a @ b = x$
$\frac{a+b}{4} = x$

10) $a @ b = x, y$
$a \circ b = x$
$a + b = y$

13) $abc \blacksquare \rightarrow x, y$
$a \cdot b = x$
$b \cdot c = y$

14) $a @ b = \frac{x}{y}$

$\frac{a+b}{a-b} = \frac{x}{y}$

15) $a @ b = x$
$\sqrt[3]{a+b} = x$

16) $a \blacksquare b = x$
$\frac{a+b}{2} = x$

[redacted]

17) $\blacktriangle 600 = 600 : 2 = 300$

18) $a @ b = x$

$a + b^2 = x$

19) $24 \blacktriangle 7 = \sqrt{24^2 + 7^2} = \sqrt{625} = 25$

$8 * 10 = 8 \cdot 10 = 80$

$25 + 80 = 105$

20) $13 + 12 = 25 \qquad 2 + 5 = (7)$

Test 3

1) $\blacktriangle(093) = \blacktriangle(9 \cdot 3) = \blacktriangle 27 =$

$= 2 + 7 = (9)$

2) $* 875 \rightarrow ?, ?$

$8 \cdot 7$ və $7 \cdot 5$

Cavab: 56 və 35

3) $a + b = x$

5) $a @ b = x$

$\frac{a+b}{3} = x$

6) $2 + 1 = 3.$

$10 - 1 = 9.$

3 və 9-u bilirsiniz (39)

7) $a @ b = x$

$(a - b) \cdot 2 = x$

8) $ab @ cd = x$

$(a \cdot b) + (c \cdot d) = x$

9) $a @ b = x$

$a^2 + b = x$

10) $a @ b = x$

$(a \cdot b) - b = x$

$= \blacktriangle(\square 72) = \blacktriangle(7 \cdot 2) = \blacktriangle 14 =$

$= 14 - 12 = \boxed{2}$

12) $(\blacktriangle 297) * = ?$

$\blacktriangle 297 = 297 : 3 = 99$

$99 * = 9 \cdot 9 = 81 \Rightarrow 8 \cdot 1 = \boxed{8}$

13) $a @ b = x$

$2a + 3b = x$

14) $548 @ 120 = ?$

$(5 \cdot 4 \cdot 8) - 120 = \boxed{60}$

15) $\blacktriangle(5253) - \blacktriangle(3252) = ?$

$\blacktriangle 5253 = 5 \cdot 2 \cdot 5 \cdot 3 = 150$

$\blacktriangle 3252 = 3 \cdot 2 \cdot 5 \cdot 2 = 60$

$150 - 60 = \boxed{90}$

17) $\frac{a}{b} \blacktriangle \frac{c}{d} = \frac{x}{y}$

$\frac{a \cdot d}{c \cdot b} = \frac{x}{y}$

18) $a @ b = x$

$2a + b^2 = x$

19) $8 + 25 = 34 \qquad 3 \cdot 4 = \boxed{12}$

20) $a @ b = x.$

$(a + b)^2 = x$

21) $(\blacktriangle 87) + (\blacktriangle 53) - (\blacktriangle 42) = ?$

$\blacktriangle 87 = 8^2 - 7^2 = 15$

$\blacktriangle 53 = 5^2 - 3^2 = 16.$

Test 4

1) $a @ b = x$
$a^3 + b = x$

2) $a @ b = x$
$(a+b) \cdot 4 = x$

3) $(7-4) \cdot (5-2) = ?$ $\quad ? = 9$

4) $(7 \cdot 4) - (3 \cdot 5) = 13$

5) $4^2 - 1^3 = 15$

6) $52 - 9 = 43$

7) $(6+0+8) - (4+1+2) = 7$

8) $@529 = ?$
$52 - 29 = 23$

9) $49 + 19 = 68$ $\quad 6 + 8 = 14$

10) $71 + 27 = 98$ $\quad 9 \cdot 8 = 72$

13) $(8 \cdot 4) - (6 \cdot 1) = 32 - 6 = 26$

14) $\frac{7+29}{2} = 18$

15) $(6+2)^2 - (4+1)^2 = ?$
$64 - 25 = 39$

16) $a \blacktriangle b = x$
$(a+b) + 5 = x$

17) $a * b = x$
$(a-b) + 2 = x$

18) $a @ b = x$ $\quad \frac{a \cdot b}{3} = x.$

19) $(36 : 6)^2 = 36.$
$a \blacksquare b = x$ $\quad (a:b)^2 = x.$

§ 2. İşləmlər

Test 5

1) $a @ b = x$

$\frac{a+b}{2} = x.$

2) $a \bullet b = x, y, z$

$a \cdot 2 = x$

$a + b = y$

$b \cdot 2 = z.$

3) $* 25 = \sqrt{25} = 5$

$\blacktriangle 10 = 10 \cdot 3 = 30$

$\blacktriangle (* 49) = \blacktriangle (\sqrt{49}) = \blacktriangle 7 = 7 \cdot 3 = 21$

4) $a @ b = x$

$(a-b)^3 = x$

6) $a @ b = x$

$(a-b) \cdot 2 = x$

7) $9 + 6 = 15 \quad 7 - 1 = 6$

$15 \cup 6 \Rightarrow 156$

8) $a @ b = x$

$a^3 - b = x$

9) $a @ b = x$

$(a-b)^2 = x$

10) $abc \blacktriangle \rightarrow cab$

$abc \bullet \rightarrow (a \cdot b; c)$

Onda

$(358 \bullet) \blacktriangle = (3 \cdot 5; 8) \blacktriangle = (15; 8) \blacktriangle =$

$= 158 \blacktriangle = 815$

13) $a @ b = x$

$a + 3b = x$

14) $(8 \cdot 7) - (8 + 7) = 41$

15) □ çıxma işarəsidir

▲ toplama işarəsidir

16) $a @ b = x$

$a^3 + b^3 = x$

17) $a @ b = x, y$

$a \cdot b = x \quad a - b = y$

18) $@a = x$

$(a \cdot 4) + 1 = x$

19) $a @ b = x$

Test 6

1) • vurma işarəsidir.

▲ toplama işarəsidir.

2) ▲ $ab = x$

$(a \cdot b)^2 = x$

3) $5 \cdot 3 = 15 \quad 5 \cdot 2 = 10.$

15 və 10 $\Rightarrow$ 1510

4) $a \blacksquare b = x, y, z$

$a : 3 = x$

$b : 3 = y$

$a - b = z$

5) $abc @ xyz = f$

$(a + b + c) + (x + y + z) = f$

6) $a * b = x$

8) $a * b = x$

$a + 2b = x$

9) $@835 = 8+3+5 = 16$

$@541 = 5+4+1 = 10$

$\$541 = 5 \cdot 4 \cdot 1 = 20$

$\$342 = 3 \cdot 4 \cdot 2 = 24$

$\$(@729) = \$(7+2+9) = \$18 = 1 \cdot 8 =$

$= (8)$

10) $a @ b = x$

$3a + b = x$

11) $(9 \cdot 3) + (2 \cdot 7) = (41)$

12) $84 \blacktriangle \blacktriangle = (8 \cdot 4) \blacktriangle = 32 \blacktriangle = 3 \cdot 2 = (6)$

13) D

16) $15 \blacktriangle 32 = x$

$(15 \cdot 2) + (32 : 2) = (46)$

17) $\dfrac{\frac{1}{a} \cdot \frac{1}{b}}{\frac{1}{a} - \frac{1}{b}} = \dfrac{\frac{1}{ab}}{\frac{b-a}{ab}} = \dfrac{1}{ab} \cdot \dfrac{ab}{b-a} = \left(\dfrac{1}{b-a}\right)$

18) $a @ b = x$

$\dfrac{a+b}{8} = x$

19) $a * b = x$

$(a \cdot b) - 3 = x$

Test 7

1) $* ab = x$

$\dfrac{a+b}{2} = x$

3) B

4) $a * b = x$
$(a-b)^2 = x$

5) ▲ → bölmə
• → vurma

6) abc x → ?
$\frac{a \cdot b \cdot c}{9} = x$

7) $a \blacktriangle b = x$
$4a - b = x$

8) $a \blacktriangle b = x$
$b^2 - a = x$

9) 762 ▲ 352 = ?
$(7 \cdot 6 \cdot 2) + (3 \cdot 5 \cdot 2) = 114$

11) $a * b = x$
$a^3 - b^2 = x$

12) $a @ b = x$
$a^2 + b^2 = x$

13) $a @ b = x$
$(a+b) \cdot 4 = x$

14) $a \bullet b = x$
$\frac{a \cdot b}{3} = x$

15) $@5 = 5^3 = 128$
$@2 = 2^3 = 8$
• $5 = 5 \cdot 2 = 10$
• $3 = 3 \cdot 2 = 6$

$@(\bullet 8) = @(8 \cdot 2) = @16 = 16^3 =$

17) $a @ b = x$

$\sqrt[3]{a} + \sqrt[3]{b} = x$

18) $ab @ cd = x$

$(a \cdot b) - (c \cdot d) = x$

19) $a @ b = x$

$\frac{a-b}{2} = x$

20) $a @ b = x$

$(a \cdot b) + (a + b) = x$

Test 8.

1) $* \rightarrow$ çıxma.

$\bullet \rightarrow$ toplama

$2 * x = 4 \bullet 8$

$2 \cdot x = 4 + 8$

2) $\frac{a}{b} \bullet \frac{b}{a} = x$

$$\frac{\frac{a}{b} - \frac{b}{a}}{\frac{a}{b} + \frac{b}{a}} = \frac{\frac{a^2 - b^2}{ab}}{\frac{a^2 + b^2}{ab}} = \frac{a^2 - b^2}{ab} \cdot \frac{ab}{a^2 + b^2} =$$

$$= \frac{a^2 - b^2}{a^2 + b^2}$$

3) $a \bullet b = x$

$a^3 + b = x$

4) $\bullet\, abc = x$

$(a + c) \cdot b = x$

5) $ab \blacktriangle c = x$

$(a \cdot b) + c^3 = x$

7) $a * b = x$

$\frac{a}{3} + 2b = x$

8) ▲ toplama

★ çıxma

9) $a * b = x$

$(a-b)^2 = x$

10) $a * b = x$

$\frac{a+b}{5} = x$

11) $a @ b \to x, y$

$\frac{a \cdot b}{2} = x$

$a - b = y$

13) $a @ b = x$

$a^2 - b = x$

14) $a * b = x$

$\frac{(a+b) \cdot (a-b)}{2} = x$

15) $a @ b = x$

$(a \cdot b) + 4 = x$

16) $a \bullet b = x$

$5a - b = x$

17) $a \bullet b = x$

$(a \cdot b) - (a+b) = x$

18) $a \bullet b = x$

$2a + b = x$

Test 9

2) $abc \Delta cde = x$

$(a+b+c)-(c+d+e)=x$

3) $a \blacksquare b = x$

$\sqrt[3]{a} \cdot \sqrt[3]{b} = x$

4) $a @ b = x$

$4a - b = x$

5) $a \circ b = x$

$\frac{a-b}{2} = x$

6) $a \bullet b = x$

$\sqrt{a} \cdot \sqrt{b} = x$

7) $a * b = x$

$3a + b = x$

9) $a @ b = x$

$(a \cdot b) - (a+b-1) = x$

10) $a @ b = x$

$a \cdot (b-2) = x$

11) $a @ b = x$

$a : b = x$

12) $a @ b = x$

$4 \cdot a^2 + b = x$

13) $a @ b = x$

$(a \cdot b) + 2 = x$

14) $abcd @ = x$

$(a+b+c+d) - 1 = x$

15) $a @ b = x$

17) $a \triangle b = a + 2b$

$a \circ b = \frac{ab}{2}$

18) $a @ b = x$

$(a^2 \cdot 2) - b = x$

19) $a @ b = x$

$(a+b) \cdot 3 = x$

20) $a @ b = x$

$\frac{a^2}{b^2} = x$

Test 10

1) $a * b = x$

$\sqrt{a \cdot b} = x$

3) $a @ b = x$

$\frac{a+b}{2} = x$

4) $a @ b = x$

$a + 3b = x$

5) $a * b = x$

$a^2 - b = x$

6) $a * b = x$

$(b - a)^2 = x$

7) $a * b = x$

$(a \cdot b) - 10 = x$

6) $a @ b = x$

$\frac{3}{2}$

9) $a @ b = x$

$4a + b = x$

10) $a @ b = x$

$\frac{a \cdot b}{4} = x$

11) $a * b = x$

$(a - b)^2 + 1 = x$

12) ▲ $a = \sqrt{a}$

■ $b = b - 20$

13) $a @ b = x$

$\sqrt{a + b} = x$

14) $a ▲ b = x$

$2a + b = x$

17) $ab @ cd = xy$.

$c - d = x \quad a - b = y$.

Cavabları birləşdirsək.

18) $* abcd = x$

$(a \cdot b) + (c + d) = x$

19) $@ abcd = xy$

$a + b = x \quad c + d = y$

Cavabları birləşdirsək.

20) ▲ $abc = x$

$(a \cdot b) + (b \cdot c) = x$

Test 11.

1) $a \bullet b = a^2 - b$

$3 \bullet 9 = 3^2 - 9 = 0$

$(3 \blacktriangledown 6) \bullet (3 \blacktriangledown 2) = ?$

$3 \blacktriangledown 6 = \frac{3 \cdot 6}{3} = 6.$

$3 \blacktriangledown 2 = \frac{3 \cdot 2}{3} = 2$

$6 \bullet 2 = 6^2 = \boxed{36}$

3) $a \Rightarrow b = a \cdot b - 3$

$a \bullet b = a^2 + b^2.$

$(3 \Rightarrow 2) \bullet (4 \Rightarrow 2) = ?$

$3 \Rightarrow 2 = (3 \cdot 2) - 3 = 3$

$4 \Rightarrow 2 = (4 \cdot 2) - 3 = 5$

$3 \bullet 5 = 3^2 + 5^2 = \boxed{34}$

4) $a \blacktriangle b = 2a + b$

$28 \Rightarrow 32 = 28 + 32 = 60$

5) $a \circ b = a^b$

$a \triangle b = a - b$

$(6 \circ 2) \triangle (5 \circ 2) = ?$

$6 \circ 2 = 6^2 = 36$

$5 \circ 2 = 5^2 = 25$

$36 \triangle 25 = 36 - 25 = \boxed{11}$

6) $a \bullet b = a^2 + b$ $\quad c = ?$

$4 \bullet 12 = c \bullet 3$

$4 \bullet 12 = c \bullet 3$

$4^2 + 12 = c^2 + 3.$

$16 + 12 = c^2 + 3$

$28 = c^2 + 3$

7) $a \bullet b = 3(a+b)$

$a \triangle b = 2(a+b)$

$a \blacktriangle b = a+b-10$

$(7 \bullet 8) \blacktriangle (6 \triangle 4) = ?$

$7 \bullet 8 = 3(7+8) = 45$

$6 \triangle 4 = 2(6+4) = 20$

$45 \blacktriangle 20 = 45+20-10 = 55$

8) $a \blacksquare b = a+4b$

$a \blacktriangle b = 3a-b$

$(3 \blacktriangle 8) \blacksquare (5 \blacktriangle 10) = ?$

$3 \blacktriangle 8 = 3 \cdot 3 - 8 = 1$

$5 \blacktriangle 10 = 3 \cdot 5 - 10 = 5$

$1 \blacksquare 5 = 1 + 4 \cdot 5 = 21$

$8 \square 2 = 8+2+2 = 12$

$5 \square 3 = 5+3+2 = 10$

$12 * 10 = 12 \cdot 10 = 120$

10) $a \bullet b = a^2 - b$ $\quad x = ?$

$5 \bullet x = 10$

$5 \bullet x = 10$

$5^2 - x = 10$

$25 - x = 10$

$x = 15$

11) $a^2 \blacksquare 3b = 2a - b$

$a \blacktriangle b = \frac{a \cdot b}{5}$

$(121 \blacksquare 9) \blacktriangle (36 \blacksquare 6) = ?$

$121 \blacksquare 9 = 11^2 \blacksquare 3 \cdot 3^6 = 2 \cdot 11 - 3 = 19$

12) $a \bullet b = a(b-1)$

$a \Delta b = 2a - b$

$(5 \bullet 4) \Delta (7 \bullet 3) = ?$

$5 \bullet 4 = 5 \cdot (4-1) = 15$

$7 \bullet 3 = 7 \cdot (3-1) = 14$

$15 \Delta 14 = 2 \cdot 15 - 14 = (16)$

13) $a * b^2 = 3a - b$

$a \Delta b = a^2 + b$

$(3 * 16) \Delta (6 * 36) = ?$

$3 * 16 = 3 * 4^2 = 3 \cdot 3 - 4 = 5$

$6 * 36 = 6 * 6^2 = 3 \cdot 6 - 6 = 12$

$5 \Delta 12 = 5^2 + 12 = (37)$

14) $a \Delta b = \frac{a}{b}$

$24 \Delta 12 = \frac{24}{12} = 2$

$36 \Delta 12 = \frac{36}{12} = 3.$

$2 * 3 = 2^3 = (8)$

15) $a @ b = 2a(a+b)$

$a \Delta b = a - b$

$(3 @ 5) \Delta (3 @ 2) = ?$

$3 @ 5 = 2 \cdot 3(3+5) = 48.$

$3 @ 2 = 2 \cdot 3(3+2) = 30$

$48 \Delta 30 = 48 - 30 = (18)$

16) $x \# y = \frac{x}{y} - 1$

$x \Delta y = \frac{x \cdot y}{2}$

$2 \Delta 5 = \frac{2 \cdot 5}{2} = 5$

17) $a \bullet b = \frac{a}{b}$

$a \Delta b = a^2 + b$

$(2 \Delta 4) \bullet (3 \Delta 7) = ?$

$2 \Delta 4 = 2^2 + 4 = 8.$

$3 \Delta 7 = 3^2 + 7 = 16.$

$8 \bullet 16 = \frac{8}{16} = \frac{1}{2}$

18) $x * y = 3x + 4y$

$x \Delta y = x - y.$

$(11 \Delta 6) * (12 \Delta 7) = ?$

$11 \Delta 6 = 11 - 6 = 5$

19) $a \blacktriangle b = 2a + b$

$a * b = a + 3b$

$a \square b = b - a$

$(8 \blacktriangle 2) * (14 \square 21) = ?$

$8 \blacktriangle 2 = 2 \cdot 8 + 2 = 18.$

$14 \square 21 = 21 - 14 = 7$

$18 * 7 = 18 + 3 \cdot 7 = 39$

20) $a \star b = a^2 - b$

$a \blacksquare b = a + b^2$

$a \bullet b = a^3 + b^2$

$(2 \bullet 3) \blacksquare (4 \star 12) = ?$

$2 \bullet 3 = 2^3 + 3^2 = 17$

$4 \star 12 = 4^2 - 12 = 4$

Test 12

1) $a * (b+2) = a \cdot b$

$8 * 5 = ?$

$8 * 5 = 8 * (3+2) = 8 \cdot 3 = 24$

2) $a \bullet b = (a+1)(b-1)$

$a \Delta b = 2a + b$

$(5 \bullet 3) \Delta (7 \bullet 5) = ?$

$5 \bullet 3 = (5+1)(3-1) = 12$

$7 \bullet 5 = (7+1)(5-1) = 32$

$12 \Delta 32 = 2 \cdot 12 + 32 = 56$

3) $a \blacksquare b = a^3 - b$

$a \blacksquare 30 = 34$

$a = ?$

4) $a \bullet b = 3a + 4b$

$4 \bullet 5 = 8 \bullet c$

$c = ?$

$4 \bullet 5 = 8 \bullet c$

$3 \cdot 4 + 5 \cdot 4 = 3 \cdot 8 + 4 \cdot c$

$12 + 20 = 24 + 4c$

$32 = 24 + 4c$

$8 = 4c$

$c = 2$

5) $a * b = a^b$

$a \blacksquare b = 3a - b^2$

$(5 * 2) \blacksquare (2 * 1) = ?$

$5 * 2 = 5^2 = 25$

$2 * 1 = 2^1 = 2$

6) $a \square b = \frac{a+b}{3}$

$a \triangle b = 2a + 3b$

$(9 \square 3) \triangle (8 \square 7) = ?$

$9 \square 3 = \frac{9+3}{3} = 4$

$8 \square 7 = \frac{8+7}{3} = 5$

$4 \triangle 5 = 2 \cdot 4 + 3 \cdot 5 = (23)$

7) $a \blacksquare b = \sqrt{a^2 - b^2}$

$a \triangle b = a + b$

$(3 \triangle 10) \blacksquare (9 \triangle 3) = ?$

$9 \triangle 3 = 9 + 3 = 12$

$3 \triangle 10 = 3 + 10 = 13$

$5 \blacktriangle 4 = 5^3 - 4^3 = (61)$

9) $a \star b = \frac{a}{5} + b$

$a @ b = a \cdot b + 3$

$(35 \star 5) @ (40 \star 2) = ?$

$35 \star 5 = \frac{35}{5} + 5 = 12$

$40 \star 2 = \frac{40}{5} + 5 = 13$

$12 @ 13 = 12 \cdot 13 + 3 =$

$40 \star 2 = \frac{40}{5} + 2 = 10.$

$12 @ 10 = 12 \cdot 10 + 3 = (123)$

10) $a \triangle b = \frac{a-c}{5}$

$12 @ 6 = (12+6) - 8 = 10$

$4 - 10 = \boxed{-6}$

11) $a * b = \frac{3}{a} + \frac{b}{2}$

$a \circ b = a^2 + 3b$

$(3 * 4) \circ (3 * 8) = ?$

$3 * 4 = \frac{3}{3} + \frac{4}{2} = 3$

$3 * 8 = \frac{3}{3} + \frac{8}{2} = 5$

$3 \circ 5 = 3^2 + 3 \cdot 5 = \boxed{24}$

12) $a \triangle b = \frac{1}{a} + \frac{1}{b}$

$a \square b = a \cdot b$

$(7 \square 2) \triangle (3 \square 5) = ?$

13) $a \star b = 3a + b^2$

$6 \star c = 2 \star 4$

$c = ?$

$6 \star c = 2 \star 4$

$3 \cdot 6 + c^2 = 3 \cdot 2 + 4^2$

$18 + c^2 = 6 + 16$

$18 + c^2 = 22$

$c^2 = 4$

$\boxed{c = 2}$

14) $a \blacktriangle b = 2a + 3b$

$a \circ b = a^2 + b^2$

$(5 \circ 6) - (6 \blacktriangle 5) = ?$

$5 \circ 6 = 5^2 + 6^2 = 61$

$6 \blacktriangle 5 = 2 \cdot 6 + 3 \cdot 5 = 27.$

15) $a \blacksquare b = 2a + b + 1$

$8 \blacksquare c = d \blacksquare 7 = 25$

$c + d = ?$

$8 \blacksquare c = d \blacksquare 7 = 25$

$c \blacksquare 8 = 7 \blacksquare d = 25$

$c \blacksquare 8 = 25$

$2 \cdot c + 8 + 1 = 25$

$2c + 9 = 25$

$2c = 16$

$c = 8.$

$7 \blacksquare d = 25$

$2 \cdot 7 + d + 1 = 25$

$14 + d + 1 = 25$

$15 + d = 25$

$d = 10$

$c + d = ?$

$8 + 10 = ?$

$18 = ?$

$? = 18$

$(5 * 4) - (5 \Delta 3) = ?$

$5 * 4 = (5+1) \cdot 4 = 24$

$5 \Delta 3 = (5 \cdot 3) + 5 = 20$

$24 - 20 = (4)$

17) $a @ b = 4a - b$

$6 @ c = d @ 4 = 7 @ 12$

$4d + c = ?$

$6 @ c = 7 @ 12$

$4 \cdot 6 - c = 4 \cdot 7 - 12$

$24 - c = 28 - 12$

$24 - c = 16.$

$-c = 16 - 24$

$-c = -8$

$d @ 4 = 7 @ 12$

$4 \cdot d - 4 = 4 \cdot 7 - 12$

$4d - 4 = 28 - 12$

$4d - 4 = 16$

$4d = 20$

18) $a * b = \frac{a}{b}$

$a \Delta b = a - b$

$(88 * 4) \Delta (77 * 11) = ?$

$88 * 4 = \frac{88}{4} = 22$

$77 * 11 = \frac{77}{11} = 7.$

$22 \Delta 7 = 22 - 7 = (15)$

19) $a * b = (a + b) \cdot 3$

$a \bullet b = 2a - b$

$(7 \bullet 5) + (5 * 2) = ?$

$7 \bullet 5 = 2 \cdot 7 - 5 = 9$

$5 * 2 = (5 + 2) \cdot 3 = 21$

$a * b = a - b + 1.$

$(4 \blacksquare 3) \Delta (9 * 5) = ?$

$4 \blacksquare 3 = 4 + 3 + 1 = 8.$

$9 * 5 = 9 - 5 + 1 = 5$

$8 \Delta 5 = 8 - 5 - 1 = (2)$

Test 13.

1) $a \Delta b = a^2 + b$

$a * b = ab + b$

$(5 \Delta 15) - (5 * 5) = ?$

$5 \Delta 15 = 5^2 + 15 = 40$

$5 * 5 = 5 \cdot 5 + 5 = 30$

$40 - 30 = (10)$

$6 \Delta 10 = (4+2) \Delta 10 = 4+10 = 14$

$10 \Delta 2 = (8+2) \Delta 2 = 8+2 = 10$

$14 \circ 10 = (14+1) \cdot 10 = 150$

7) $a * b = 2a + 3b$

$c * 6 = 6 * 4$

$c = ?$

$c * 6 = 6 * 4$

$2 \cdot c + 3 \cdot 6 = 2 \cdot 6 + 3 \cdot 4$

$2c + 18 = 12 + 12$

$2c + 18 = 24$

$2c = 6$

$c = 3$

8) $a @ b = a^2 - b^2$

$(3 @ c) = (5 @ d) = 9$

$3 @ c = 9$

$3^2 - c^2 = 9$

$9 - c = 9$

$-c = 9 - 9$

$-c = 0$

$c = 0$

$5 @ d = 9$

$5^2 - d^2 = 9$

$25 - d^2 = 9$

$-d^2 = 9 - 25$

$-d^2 = -16$

$d^2 = 16$

$d = 4$

$c + d = ?$

$0 + 4 = ?$

$? = 4$

9) $a^3 \blacktriangle b^3 = (a+b) \cdot 2$

$125 \blacktriangle 64 = ?$

$125 \blacktriangle 64 = 5^3 \blacktriangle 4^3 = (5+4) \cdot 2 =$

$10 \blacktriangle 4 = (5+5) \blacktriangle 4 = 2 \cdot 5 - 2 \cdot 4 =$

$= 10 - 8 = (2)$

11) $\frac{1}{a \Delta b} = \frac{2}{a+2b}$

$4 \Delta 3 = ?$

$\frac{1}{a \Delta b} = \frac{2}{a+2b}$

$a + 2b = 2(a \Delta b)$

$2(a \Delta b) = a + 2b$

$a \Delta b = \frac{a+2b}{2}$.

qymətləri yerinə qoysaq.

$4 \Delta 3 = \frac{a+2b}{} = \frac{4+2 \cdot 3}{} = (5)$

$(3 \cdot (a * b)) + 3 = 6 \cdot (a - b)$

$3 \cdot (a * b) + 3 = 6a - 6b$

$3 \cdot (a * b) = 6a - 6b - 3$

$3 \cdot (a * b) = 3(2a - 2b - 1)$

$a * b = \frac{3(2a - 2b - 1)}{3}$.

$a * b = 2a - 2b - 1$.

$a * b = 2 \cdot 4 - 2 \cdot 2 - 1 = 8 - 4 - 1 =$

$= (3)$

13) $a * b = a(b - 2)$

$a \Delta b = a + 3 + b$

$[5 * (7 \Delta 4)] = ?$

$[5 * (7 \Delta 4)] = ?$

$[5 * (7 + 3 + 4)] = ?$

?=60

14) $x * y = x^y - y^x$

$(2 * 5) = ?$

$2 * 5 = 2^5 - 5^2 = 32 - 25 = 7$

15) $\frac{2(a \Delta b)}{3} = \frac{6}{2a+b}$

$2 \Delta 5 = ?$

$\frac{2(a \Delta b)}{3} = \frac{6}{2a+b}$

$2(a \Delta b) \cdot (2a+b) = 3 \cdot 6$

$2(a \Delta b) \cdot (2a+b) = 18$

$(a \Delta b) \cdot (2a+b) = \frac{18}{2}$

$a \Delta b = \frac{9}{2 \cdot 2 + 5}$

$a \Delta b = \frac{9}{4+5}$

$a \Delta b = \frac{9}{9}$

$a \Delta b = 1$

16) $x * y = x^2 + y$

$x \Delta y = x \cdot y + 3$

$x \square y = x + y - 10$

$(6 * 12) \square (5 \Delta 12) = ?$

$6 * 12 = 6^2 + 12 = 36 + 12 = 48$

$5 \Delta 12 = 5 \cdot 12 + 3 = 63$

$48 \square 63 = 48 + 63 - 10 = 101$

$8 \blacktriangle 9 = 2 \cdot 8 + 3 \cdot 9 = 16 + 27 = 43$

$3 * 2 = 3 \cdot 2 + 8 = 6 + 8 = 14$

$43 - 14 = (29)$

18) $a^3 * 4b = a^2 + 3b$

$(64 * 28) = ?$

$(64 * 28) = ?$

$4^3 * 4 \cdot 7 = 4^2 + 3 \cdot 7 = 16 + 21 =$

$= (37)$

19) $\dfrac{1}{1 + \dfrac{1}{1 + (a \Delta b)}} = a + b - 2$

$4 \Delta 2 = ?$

$\dfrac{1}{1 \cdot (1 + (a \Delta b))} = 4 + 2 - 2$

$\dfrac{1}{\dfrac{1 + a \Delta b + 1}{1 + (a \Delta b)}} = 4$

$\dfrac{1}{\dfrac{2 + a \Delta b}{1 + a \Delta b}} = 4$

$\dfrac{1 + a \Delta b}{2 + a \Delta b} = 4$

$8 + 4(a \Delta b) = 1 + (a \Delta b)$

$7 = (a \Delta b) - 4(a \Delta b)$

$7 = -3(a \Delta b)$

$-3(a \Delta b) = 7$

$a \Delta b = \dfrac{7}{-3}$

20) $\frac{2+\frac{a\Delta b}{2}}{24} = \frac{1}{2a+b}$

$2\Delta 2 = ?$

$\frac{2+\frac{a\Delta b}{2}}{24} = \frac{1}{2a+b}$

$\frac{4+(a\Delta b)}{\frac{2}{24}} = \frac{1}{2a+b}$

$\frac{4+(a\Delta b)}{\frac{2}{24}} = \frac{1}{2\cdot 2+2}$

$\frac{4+(a\Delta b)}{\frac{2}{24}} = \frac{1}{6}$

$\frac{4+(a\Delta b)}{\frac{2}{24}} \cdot 6 = 24$

$4+(a\Delta b) = 8.$

$a\Delta b = 4$

Test 14

1) $x\Delta y = xy+y$

$5\Delta 9 = ?$

$5\Delta 9 = 5\cdot 9 + 9 = 45+9 = (54)$

2) $a^2 @ b = a\cdot b - 8$

$144 @ 5 = ?$

$144 @ 5 = 12^2 @ 5 = 12\cdot 5 - 8 =$

$= 60 - 8 = (52)$

3) $3a @ b^2 = a+b$

$4a * 2b = a+b^2$

$(16 * 10) - (18 @ 16) = ?$

4) $x @ y = x^2 - y^2 + 1$

$9 @ 7 = ?$

$9 @ 7 = 9^2 - 7^2 + 1 = 81 - 49 + 1 =$

$= (33)$

5) $a \# b = 2a + 3b$

$a * b = a^2 + b$

$a \bullet b = a + b$

$(9 \# 7) \bullet (2 * 13) = ?$

$9 \# 7 = 2 \cdot 9 + 3 \cdot 7 = 18 + 21 = 39$

$2 * 13 = 2^2 + 13 = 4 + 13 = 17$

$39 \bullet 17 = 39 + 17 = (56)$

6) $x \bigstar y = x + y + 1$

$2x \blacktriangle y = x \cdot y$

$26 \blacktriangle 13 = 2 \cdot 13 \blacktriangle 13 = 13 \cdot 13 =$

$= (169)$

7) $12a \bigstar b^3 = a + 2b$

$a \blacktriangle 3b = a \cdot b + 1$

$(60 \bigstar 125) \blacktriangle (48 \bigstar 64) = ?$

$60 \bigstar 125 = 12 \cdot 5 \bigstar 5^3 = 5 + 2 \cdot 5 =$

$= 5 + 10 = 15$

$48 \bigstar 64 = 12 \cdot 4 \bigstar 4^3 = 4 + 2 \cdot 4 = 12$

$15 \blacktriangle 12 = 15 \blacktriangle 3 \cdot \overset{b}{4} = 15 \cdot 4 + 1 = (61)$

8) $7a \bigstar 3b = a^2 - b$

$a^2 \blacksquare b = a + b^2$

$77 - 39 = (38)$

9) $10x \# y = x + 5y$

$5x \blacksquare 2y = x \cdot y - 4$

$(120 \# 4) + (15 \blacksquare 20) = ?$

$120 \# 4 = 10 \cdot 12 \# 4 = 12 + 5 \cdot 4 = 32$

$15 \blacksquare 20 = 5 \cdot 3 + 2 \cdot 10 = 3 \cdot 10 - 4 = 26$

$32 + 26 = (58)$

10) $x \square y = x^2 + y - 1$

$x \bullet y = 2x + y$

$(5 \square 4) \bullet 4 = ?$

$5 \square 4 = 5^2 + 4 - 1 = 28$

$28 \bullet 4 = 2 \cdot 28 + 4 = (60)$

11) $a^3 \square b = 2a - b^2$

$125 \square 3 = 5^3 \square 3 = 2 \cdot 5 - 3^2 = 1$

$64 \square 2 = 8^2 \square 2 = 2 \cdot 8 - 2^2 = 12$

$1 \bullet 12 = 1 \cdot 12 + 13 = (25)$

$64 \square 2 = 4^3 \square 2 = 2 \cdot 4 - 2^2 = 4$

$1 \bullet 4 = 1 \cdot 4 + 13 = (17)$

12) $a \bigstar \rightarrow a^2 - 4$

$\blacktriangle b \rightarrow b^2 - 144$

$\blacktriangle (4 \bigstar) = ?$

$4 \bigstar = 4^2 - 4 = 12$

$\blacktriangle 12 = 12^2 - 144 = (0)$

13) $4x \circ 5y = 2x + y^3$

$16 \circ 20 = ?$

$16 \circ 20 = 4 \cdot 4 \circ 5 \cdot 4 = 2 \cdot 4 + 4^3 =$

14) $x \circ y = x + y^2$

$x \blacksquare y = x \cdot y$

$(5 \blacksquare 4) - (3 \circ 3) = ?$

$5 \blacksquare 4 = 5 \cdot 4 = 20$

$3 \circ 3 = 3 + 3^2 = 12$

$20 - 12 = (8)$

15) $a^3 \blacktriangledown 2b = a - b$

$a \blacksquare b = a^2 \cdot b$

$(5 \blacksquare 4) - (125 \blacktriangledown 4) = ?$

$5 \blacksquare 4 = 5 \blacksquare 4 = 5^2 \cdot 4 = 100$

$125 \blacktriangledown 4 = 5^3 \blacktriangledown 2 \cdot 2 = 5 - 2 = 3$

$100 - 3 = (97)$

16) $8x \blacksquare 12y = 2x + y^2$

$24 \blacksquare 36 = 8 \cdot 3 \blacksquare 12 \cdot 3 = 2 \cdot 3 + 3^2 =$

$= 6 + 9 = 15$

$15 \bigstar 16 = 5 \cdot 15 \bigstar 4 \cdot 4 = 15 - 3 \cdot 4 =$

$= 3.$

$15 + 3 = (18)$

17) $m @ n^2 = m^3 - n$

$m \blacktriangle 2n = m \cdot n$

$2m \bigstar n = m - n$

$(2 @ 25) \blacktriangle (24 \bigstar 4) = ?$

$2 @ 25 = 2 @ 5^2 = 2^3 - 5 = 3$

$24 \bigstar 4 = 2 \cdot 12 \bigstar 4 = 12 - 4 = 8.$

$3 \blacktriangle 8 = 3 \blacktriangle 2 \cdot 4 = 3 \cdot 4 = (12)$

18) $7m \bigstar n^2 = m + 2n - 1$

$28 \bigstar 36 = 7 \cdot 4 \bigstar 6^2 = 4 + 2 \cdot 6 - 1 =$
$= 4 + 12 - 1 = 15$
$18 \blacksquare 10 = 3 \cdot 6 \blacksquare 2 \cdot 5 = 6 \cdot 5 + 1 = 31$

$15 + 31 = (46)$

19) $3a \circledcirc 4b = 2a + b$
$5a \blacksquare 8b = a \cdot b - 1$
$a^2 \# b = 2a + 3b$
$(36 \# 4) \circledcirc (25 \blacksquare 40) = ?$

$36 \# 4 = 6^2 \# 4 = 2 \cdot 6 + 3 \cdot 4 =$
$= 12 + 12 = 24$
$25 \blacksquare 40 = 5 \cdot 5 + 8 \cdot 5 = 5 \cdot 5 - 1 = 24$
$24 \circledcirc 24 = 3 \cdot 8 \circledcirc 4 \cdot 6 = 2 \cdot 8 + 6 = (22)$

20) $15x \blacktriangle 3y = 2x - y$
$x^2 \bullet y^2 = x + y$
$25 + 7 = (32)$

Test 15

1) $a^3 \Delta b = a^2 - b$
$64 \Delta 12 = ?$

$64 \Delta 12 = 4^3 \Delta 12 = 4^2 - 12 = (4)$

2) $a \Delta b = a^3 - ab$
$a \circledcirc b = a^2 + 3b$
$(5 \Delta 12) - (3 \circledcirc 17) = ?$

$5 \Delta 12 = 5^3 - 5 \cdot 12 = 65$
$3 \circledcirc 17 = 3^2 + 3 \cdot 17 = 60$

$65 - 60 = (5)$

3) $2a \Delta b^2 = a + b^3 - 1$

$16 * 24 = 4\cdot 4 * 4\cdot 6 = 4\cdot 6 + 1 = 25$

$10 \Delta 4 = 2\cdot 5 \Delta 2^2 = 5 + 2^3 - 1 = 12$

$25 + 12 = (37)$

4) $12a \Delta 22b = a^2 + b^2 + 5$

$5a + 7b = a\cdot b + 13$

$(48 \Delta 110) - (15 + 21) = ?$

$48 \Delta 110 = 12\cdot 4 \Delta 22\cdot 5 = 4^2 + 5^2 + 5 =$

$= 16 + 25 + 5 = 46.$

$15 + 21 = 5\cdot 3 + 7\cdot 3 = 3\cdot 3 + 13 = 9 + 13 =$

$= 22$

$46 - 22 = (24)$

5) $a @ b = ab + 3$

$a \# b = 2a - b$

$a \bullet b = a + 3b$

$(4 @ 2) \bullet (8 \# 2) = ?$

6) $x @ y = x + y + 5$

$x \# y = x^2 - y$

$x \bullet y = x\cdot y$

$(5 \# 10) \bullet (7 @ 1) = ?$

$5 \# 10 = 5^2 - 10 = 15$

$7 @ 1 = 7 + 1 + 5 = 13.$

$15 \bullet 13 = 15\cdot 13 = (195)$

7) $a^3 \square 3b = a + 2b$

$4a @ 2b = a + b^2$

$5a \bullet b^2 = \frac{a}{2} + 3b$

$(40 \bullet 16) @ (64 \square 12) = ?$

$40 \bullet 16 = 5\cdot 8 \bullet 4^2 = \frac{8}{2} + 3\cdot 4 = 16.$

$64 \square 12 = 4^3 \square 3\cdot 4 = 4 + 2\cdot 4 = 12$

8) $15a \blacksquare 7b = 5a + 3b$

$a^3 @ 4b = a + b + 1$

$(45 \blacksquare 28) + (125 @ 40) = ?$

$45 \blacksquare 28 = 15 \cdot 3 \blacksquare 7 \cdot 4 = 5 \cdot 3 + 3 \cdot 4 =$

$= 15 + 12 = 27$

$125 @ 40 = 5^3 @ 4 \cdot 10 = 5 + 10 + 1 = 16$

$27 + 16 = (43)$

9) $3x @ y = x + 3y$

$5x \# y^3 = x \cdot y - 1$

$(12 @ 4) + (20 \# 125) = ?$

$12 @ 4 = 3 \cdot 4 @ 4 = 4 + 3 \cdot 4 = 16$

$20 \# 125 = 5 \cdot 4 \# 5^3 = 4 \cdot 5 - 1 = 19$

$16 + 19 = (35)$

$2 \Delta 4 = 2^2 + 4 + 3 = 4 + 4 + 3 = 11$

$5 \# 3 = 5 + 3^2 - 2 = 5 + 9 - 2 = 12$

$11 @ 12 = 3 \cdot 11 + 12 + 4 = (49)$

11) $9a > 7b = a^2 + b + 4$

$12a < 5b = a + b + 12$

$a \bullet b = a \cdot b$

$(27 > 14) \bullet (48 < 25) = ?$

$27 > 14 = 9 \cdot 3 > 7 \cdot 2 = 3^2 + 2 + 4 = 15$

$48 < 25 = 12 \cdot 4 < 5 \cdot 5 = 4 + 5 + 12 = 21$

$15 \bullet 21 = 15 \cdot 21 = (315)$

12) $x \$ y = x + y + xy$

$x \star y = 2x + 2y + 5$

$(7 \$ 5) + (5 \star 3) = ?$

13) $14a \star 7b = a^2 + b + 3$

$5a \blacksquare b^3 = a \cdot b + 1$

$(42 \star 14) + (45 \blacksquare 8) = ?$

$42 \star 14 = 14 \cdot 3 \star 7 \cdot 2 = 3^2 + 2 + 3 =$

$= 14$

$45 \blacksquare 8 = 5 \cdot 9 \blacksquare 2^3 = 9 \cdot 2 + 1 = 19$

$14 + 19 = 33.$

14) $8a \star 3b = a^2 + b - 1$

$3a \blacksquare b = a + 2b + 3$

$(48 \star 21) + (15 \blacksquare 12) = ?$

$48 \star 21 = 8 \cdot 6 \star 3 \cdot 7 = 6^2 + 7 - 1 =$

$= 36 + 7 - 1 = 42$

$15 \blacksquare 12 = 3 \cdot 5 \blacksquare b = 5 + 2 \cdot 12 + 3 =$

$= 32$

$a \star b = a + b + 4$

$(125 \circ 21) \star (81 \bullet 8) = ?$

$125 \circ 21 = 5^3 \circ 3 \cdot 7 = 5^2 + 2 \cdot 7 = 25 + 14 =$

$= 39$

$81 \bullet 8 = 3^4 \bullet 2 \cdot 4 = 3 + 4^2 = 19.$

$39 \star 19 = 39 + 19 + 4 = \boxed{62}$

16) $6a @ 7b = a \cdot b - 1$

$a^3 \# b^2 = (a + b) \cdot 2$

$(36 @ 14) + (125 \# 16) = ?$

$36 @ 14 = 6 \cdot 6 @ 7 \cdot 2 = 6 \cdot 2 - 1 = 11$

$125 \# 16 = 5^3 \# 4^2 = (5 + 4) \cdot 2 = 18$

$11 + 18 = \boxed{29}$

17) $7a @ b^3 = a - b + 4$

$15 * 7 = ?$

$3 \cdot 5 * 7 = 5 + 7 - 4 = 8$

3) $a \Delta b = 2a + 3b$

$a \Delta 5 = 35$

$a = ?$

$a \Delta 5 = 35$

$2 \cdot a + 3 \cdot 5 = 35$

$2a + 15 = 35$

$2a = 20$

$a = 10$

4) $a * b = a^2 b - b^2 a$

$5 * 4 = ?$

$5 * 4 = 5^2 \cdot 4 - 4^2 \cdot 5 = 100 - 80 = 20$

$(15 \Delta 18) * (25 \Delta 12) = ?$

$15 \Delta 18 = \frac{5}{15} + \frac{6}{18} = \frac{1}{3} + \frac{1}{3} = \frac{2}{3}$

$25 \Delta 12 = \frac{5}{25} + \frac{6}{12} = \frac{1}{5} + \frac{1}{2} = \frac{2+5}{10} =$

$= \frac{7}{10}$

$\frac{2}{3} * \frac{7}{10} = \frac{1}{\frac{2}{3} \cdot \frac{7}{10_5}} = \frac{1}{\frac{7}{15}} = \frac{15}{7}$

6) $x \circ y = (x+1) \cdot y$

$(x+2) \Delta y = x + y$

$(6 \Delta 10) \circ (10 \Delta 2) = ?$

$6 \Delta 10 = (4+2) \Delta 10 = 4 + 2 = 6$

$28 @ 64 = 7 \cdot 4 @ 4^3 = 4 - 4 + 4 = 4$

$19 + 4 = (23)$

18) $a \bigstar b = a + b^2 + ab$

$a @ b = a \cdot b + 5$

$a \blacktriangle b = a^2 + b + 10$

$(8 \bigstar 3) @ (2 \blacktriangle 7) = ?$

$2 \bigstar 3 = 8 + 3^2 + 8\,3 = 8 + 9 + 24 = 41$

$2 \blacktriangle 7 = 2^2 + 7 + 10 = 4 + 7 + 10 = 21$

$41 @ 21 = 41 \cdot 21 + [redacted] = [redacted]\ (866)$

19) $5a \bigstar 7b = a^2 + b + 10$

$3a \blacksquare b = a \cdot b$

$(18 \blacksquare 4) + (20 \bigstar 14) = ?$

$18 \blacksquare 4 = 3 \cdot 6 \blacksquare 4 = 6 \cdot 4 = 24$

20) $a @ b = a^2 - b^2$

$a \# b = (a - b)^3$

$((5 @ 4) \# 5) = ?$

$5 @ 4 = 5^2 - 4^2 = 25 - 16 = 9$

$9 \# 5 = (9 - 5)^3 = [redacted]\ (12)$

21) $12x @ 15y = x \cdot y$

$12x * 13y = x + y$

$(36 * 39) + (48 @ 75) = ?$

$36 * 39 = 12 \cdot 3 * 13 \cdot 3 = 3 + 3 = 6$

$48 @ 75 = 12 \cdot 4 @ 15 \cdot 5 = 4 \cdot 5 = 20$

$6 + 20 = (26)$

Test 16.

1) $x @ y = 2x + 4y + 12$

$5 @ 4 = ?$

2) $2x @ y = x + 2y$

$32 @ 12 = ?$

$32 @ 12 = 2 \cdot 16 @ 12 = 16 + 2 \cdot 12 = 40$

3) $x^2 \square 3y = xy + 1$

$25 \square 18 = ?$

$25 \square 18 = 5^2 \square 3 \cdot 6 = 5 \cdot 6 + 1 = 31$

4) $x^3 @ 5y = x + y^2 - 1$

$(125 @ 20) = ?$

$125 @ 20 = 5^3 @ 5 \cdot 4 = 5 + 4^2 - 1 =$

$= 5 + 16 - 1 = 20$

5) $3x @ 4y = xy + 4$

$21 @ 16 = ?$

6) $5x \bigcirc y^2 = x^2 + y$

$3x @ y = x + 3y$

$(15 \bigcirc 36) + (27 @ 7) = ?$

$15 \bigcirc 36 = 5 \cdot 3 \bigcirc 6^2 = 3^2 + 6 = 15$

$27 @ 7 = 3 \cdot 9 @ 7 = 9 + 3 \cdot 7 = 30$

$15 + 30 = 45$

7) $13x @ y = x + 11y$

$10x \# y^2 = x \cdot y$

$(100 \# 36) - (39 @ 2) = ?$

$100 \# 36 = 10 \cdot 10 \# 6^2 = 10 \cdot 6 = 60$

$39 @ 2 = 13 \cdot 3 @ 2 = 3 + 11 \cdot 2 = 25$

$60 - 25 = 35$

8) $13y @ 13x = xy + 2$

$24 \# 125 = 12 \cdot 2 \# 5^3 = 5 + 2 = 7$

$8 + 7 = \boxed{15}$

9) $a @ b = 2a + b$

$10 @ b = 50$

$b = ?$

$10 @ b = 50$

$2 \cdot 10 + b = 50$

$20 + b = 50$

$\boxed{b = 30}$

10) $a @ b = 2a + 3b$

$7 @ b = 44$

$b = ?$

$7 @ b = 44$

11) $a^2 @ b = a \cdot b + b$

$25 @ b = 36$

$b = ?$

$25 @ b = 36.$

$5^2 @ b = 36.$

$5 \cdot b + b = 36$

$5b + b = 36.$

$6b = 36$

$\boxed{b = 6}$

12) $7a @ b^2 = a + 3b - 1$

$a \# b = 12a - 2b$

$(21 @ 16) + (2 \# 8) = ?$

$21 @ 16 = 7 \cdot 3 @ 4^2 = 3 + 3 \cdot 4 - 1 = 3 +$

$+ 12 - 1 = 14$

13) $a * b = a^2 - b^2$

$a @ b = 11a - 7b$

$a \# b = a + b$

$(13 * 12) \# (7 @ 11) = ?$

$13 * 12 = 13^2 - 12^2 = 169 - 144 = 25$

$7 @ 11 = 11 \cdot 7 - 7 \cdot 11 = 0$

$25 \# 0 = 25 + 0 = (25)$

14) $a * b = a + b + 12$

$a \blacktriangle b = a^2 + b - 1$

$(7 * 9) + (12 \blacktriangle 8) = ?$

$7 * 9 = 7 + 9 + 12 = 28.$

$12 \blacktriangle 8 = 12^2 + 8 - 1 = 144 + 8 - 1 = 151$

$28 + 151 = (179)$

$28 * 64 = 7 \cdot 4 * 4^3 = \frac{4+4}{2} = 4$

$4 \blacktriangle 9 = 4 \cdot 9 = (36)$

16) $a^2 * b = a \cdot b - 1.$

$a \blacktriangle b = \frac{a-b}{2}.$

$(81 * 9) \blacktriangle 20 = ?$

$81 * 9 = 9^2 * 9 = 9 \cdot 9 - 1 = 80$

$80 \blacktriangle 20 = \frac{80-20}{2} = (30)$

17) $5x * 2y = (x+y) \cdot 3$

$x \Delta y = x \cdot y + 11$

$(25 * 10) + (2 \Delta 5) = ?$

$25 * 10 = 5 \cdot 5 * 2 \cdot 5 = (5+5) \cdot 3 = 30$

$2 \Delta 5 = 2 \cdot 5 + 11 = 10 + 11 = 21$

18) $2x @ y = 10x - y$

$24 @ y = 100$

$y = ?$

$24 @ y = 100$

$2 \cdot 12 @ y = 100$

$10 \cdot 12 - y = 100$

$120 - y = 100$

$-y = 100 - 120$

$-y = -120$

$y = 120$

19) $a * b = \frac{a+b}{3}$

$a @ b = a \cdot b - 1$

$a \bullet b = \frac{a+b}{2}$

$13 \bullet 23 = \frac{13+23}{2} = 18$

20) $a * b = a + b^2$

$a \# b = \frac{a+b}{4}$

$a \bullet b = a \cdot b + 1$

$(5 * 2) \# (2 \bullet 3) = ?$

$5 * 2 = 5 + 2^2 = 5 + 4 = 9$

$2 \bullet 3 = 2 \cdot 3 + 1 = 6 + 1 = 7$

$9 \# 7 = \frac{9+7}{4} = 4$

21) $a \bullet b = \frac{a \cdot b}{2}$

$a \square b = a + 2b$

$(5 \bullet 4) \square (7 \bullet 6) = ?$

$\frac{5 \cdot 4}{2} \square \frac{7 \cdot 6}{2}$

Test 17

1) $a \blacksquare b = a+b-1$

$15 \blacksquare 17 = ?$

$15 \blacksquare 17 = 15+17-1 = (31)$

2) $a \Delta b = a \cdot b + 7$

$5 \Delta 4 = ?$

$5 \Delta 4 = 5 \cdot 4 + 7 = 20 + 7 = (27)$

3) $3a \Delta b = a + 3b - 1$

$18 \Delta 9 = ?$

$18 \Delta 9 = 3 \cdot 6 \Delta 9 = 6 + 3 \cdot 9 - 1 =$

$= 6 + 27 - 1 = (32)$

4) $8a * b^3 = a + b^2 - 1$

$7a \bullet 3b = a \cdot b + 1$

$21 \bullet 12 = 7 \cdot 3 \bullet 3 \cdot 4 = 3 \cdot 4 + 1 = 13$

$11 + 13 = (24)$

5) $5x * 2y = (x+y) \cdot 4$

$x^2 \blacktriangledown y = x + y^2$

$(20 * 10) - (36 \blacktriangledown 4) = ?$

$20 * 10 = 5 \cdot 4 * 2 \cdot 5 = (4+5) \cdot 4 =$

$= 36.$

$36 \blacktriangledown 4 = 6^2 \blacktriangledown 4 = 6 + 4^2 = 6 + 16 = 22$

$36 - 22 = (14)$

6) $4x * y = x + 3y - 2$

$x \bullet y^3 = x^2 + y - 4$

$(5 \bullet 27) + (16 * 2) = ?$

$24 + 8 = 32$

7) $3x * 2y = x + 5y + 3$

$x \bullet y^3 = 5x - y$

$(21 * 4) + (4 \bullet 27) = ?$

$21 * 4 = 3\ 7 * 2 \cdot 2 = 7 + 5 \cdot 2 + 3 =$

$= 7 + 10 + 3 = 20$

$4 \bullet 27 = 4 \bullet 3^3 = 5 \cdot 4 - 3 = 17$

$20 + 17 = (37)$

8) $18\ x \blacktriangle 2y = x + 3y + x^2$

$54 \blacktriangle 12 = ?$

$54 \blacktriangle 12 = 18 \cdot 3 \blacktriangle 2 \cdot 6 = 3 + 3 \cdot 6 + 3^2 =$

$= 3 + 18 + 9 = (30)$

9) $3x \Delta y = x + y^3$

$25 + y^3 = 33$

$y^3 = 8$

$(y = 2)$

10) $x * y = \frac{x \cdot y}{3}$

$x \bullet y = (x - y) \cdot 2$

$(9 * 21) + (15 \bullet 12) = ?$

$9 * 21 = \frac{9 \cdot 21}{3} = 63$

$15 \bullet 12 = (15 - 12) \cdot 2 = 6.$

$63 + 6 = (69)$

11) $13a \square b^2 = a + 2b$

$11a \bullet b^3 = a \cdot b$

$(39 \square 81) + (44 \bullet 125) = ?$

$21+20=41$

12) $x \bullet y = \frac{x \cdot y}{5}$

$x \Delta y = x^2 + y + 5$

$(5 \Delta 10) \bullet (5 \Delta 15) = ?$

$5 \Delta 10 = 5^2 + 10 + 5 = 25 + 10 + 5 = 40$

$5 \Delta 15 = 5^2 + 15 + 5 = 25 + 15 + 5 = 45$

$40 \bullet 45 = \frac{40 \cdot 45}{5} = 40 \cdot 9 = 360$

13) $2x^2 \bullet 3y = x + y^2 + 10$

$72 \bullet 15 = ?$

$72 \bullet 15 = 2 \cdot 6^2 \bullet 3 \cdot 5 = 6 + 5^2 + 10 =$

$= 6 + 25 + 10 = 41$

$8 @ 9 = 4 \cdot 2 @ 3^2 = (2+3) \cdot 2 = 10.$

$12 @ 4 = 4 \cdot 3 @ 2^2 = (3+2) \cdot 2 = 10.$

$10 \bullet 10 = 5 \cdot 2 \bullet 10 = 2 + 2 \cdot 10 =$

$= 2 + 20 = 22$

15) $3x \bullet 2y = xy + 12$

$18 \bullet 12 = ?$

$18 \bullet 12 = 3 \cdot 6 \bullet 2 \cdot 6 = 6 \cdot 6 + 12 =$

$= 36 + 12 = 48$

16) $x @ y = \frac{x - y}{3}$

$x \# y = (x + y) \cdot 2 - 1$

$(39 @ 12) \# (19 @ 7) = ?$

$39 @ 12 = \frac{39 - 12}{3} = 9.$

17) $5x^2 @ 10y = (x+y) \cdot 2$

$125 @ 120 = ?$

$125 @ 120 = 5 \cdot 5^2 @ 10 \cdot 12 =$

$= (5+19) \cdot 2 = 34$

18) $a @ b = a^3 - b^2$

$a * b = \frac{a \cdot b}{2}$

$(4 @ 5) - (12 * 5) = ?$

$4 @ 5 = 4^3 - 5^2 = 64 - 25 = 39$

$12 * 5 = \frac{12 \cdot 5}{2} = 30$

$39 - 30 = 9$

19) $x * y = \frac{x+y}{4}$

$x \bullet y = \frac{x+2y-1}{2}$

$7 \bullet 9 = \frac{7+2 \cdot 9 - 1}{2} = \frac{7+18-1}{2} = \frac{24}{2} =$

$= 12$

20) $x * y^3 = x^2 + y$

$3x \bullet 2y = x \cdot y + 3$

$(7 * 125) - (12 \bullet 16) = ?$

$7 * 125 = 7 * 5^3 = 7^2 + 5 = 54$

$12 \bullet 16 = 3 \cdot 4 \bullet 2 \cdot 8 = 4 \cdot 8 + 3 = 35$

$54 - 35 = 19$

21) $4x @ 7y = x + 2y + 1$

$16 @ 21 = ?$

$16 @ 21 = 4 \cdot 4 @ 7 \cdot 3 = 4 + 2 \cdot 3 + 1 =$

$= 4 + 6 + 1 = 11$

$3 * 4 = 3^2 + 4^2 - 1 = 9 + 16 - 1 = 24$

$24 \bullet 12 = \frac{24 \cdot 12}{2} = 144$

23) $17x \,@\, 14y = x \cdot y$

$18x * 16y = x + y$

$(34 \,@\, 28) + (57 * 64) = ?$

$34 \,@\, 28 = 17 \cdot 2 \,@\, 14 \cdot 2 = 2 \cdot 2 = 4$

$57 * 64 = 19 \cdot 3 * 16 \cdot 4 = 3 + 4 = 7$

$4 + 7 = 11$

Test 18.

1) $a^2 @ b^3 = a + b^2$

$a \bullet b = a^2 - b^2$

$(16 \,@\, 64) + (5 \bullet 4) = ?$

$16 \,@\, 64 = 4^2 @ 4^3 = 4 + 4^2 = 4 + 16$

2) $a \blacksquare b = (a \bullet b) - 2$

$a \bullet b = (a \blacktriangle b) + 3.$

$a \blacktriangle b = \frac{a \cdot b}{2}.$

$5 \blacksquare 4 = ?$

$5 \blacksquare 4 = (5 \bullet 4) - 2$

$(5 \bullet 3) - 2 = ((5 \blacktriangle 3) + 3) - 2 = (5 \blacktriangle 3) + 3 - 2 = (5 \blacktriangle 3) + 1$

$(5 \blacktriangle 3) + 1 = \frac{5 \cdot 3}{2} +$

$(5 \bullet 4) - 2 = ((5 \blacktriangle 4) + 3) - 2 =$

$= (5 \blacktriangle 4) + 3 - 2 = (5 \blacktriangle 4) + 1.$

$(5 \blacktriangle 4) + 1 = \left(\frac{5 \cdot 4}{2}\right) + 1 = 10 + 1 = 11$

3) $a \bullet b = a + 3b$

$32 \bullet 15 = 32 + 3 \cdot 15 = 32 + 45 =$

$= (77)$

4) $5a \bullet 3b = 2a - b$

$a^2 \blacktriangle b^2 = a - b$

$(75 \bullet 9) + (25 \blacktriangle 4) = ?$

$75 \bullet 9 = 5 \cdot 15 \bullet 3 \cdot 3 = 2 \cdot 15 - 3 = 27$

$25 \blacktriangle 4 = 5^2 \blacktriangle 2^2 = 5 - 2 = 3$

$27 + 3 = (30)$

5) $a \blacktriangle b = 3a - b$

$a \bullet b = a^2 + b$

$(2 \bullet 3) \blacktriangle (4 \blacktriangle 1) = ?$

$2 \bullet 3 = 2^2 + 3 = 4 + 3 = 7$

$4 \blacktriangle 1 = 3 \cdot 4 - 1 = 12 - 1 = 11$

$(4 \bigstar 5) \bullet (3 \bigstar 2) = ?$

$4 \bigstar 5 = \frac{4 \cdot 5}{2} = 10$

$3 \bigstar 2 = \frac{3 \cdot 2}{2} = 3.$

$10 \bullet 3 = 10 \cdot 3 - 1 = (29)$

7) $4a \bullet b = a \cdot b - 2$

$5a \blacktriangle b^2 = a \cdot b$

$(20 \bullet 3) - (20 \blacktriangle 9) = ?$

$20 \bullet 3 = 4 \cdot 5 \bullet 3 = 5 \cdot 3 - 2 = 15 - 2 = 13.$

$20 \blacktriangle 9 = 5 \cdot 4 \blacktriangle 3^2 = 4 \cdot 3 = 12$

$13 - 12 = (1)$

8) $8 \blacktriangle b = (a \bullet b) - 3a$

$a \bullet b = (a \bigstar b) + 15$

$5 \blacktriangle 4 = (5 \bullet 4) - 3 \cdot 5 = (5 \bullet 4) - 15$

$(5 \bullet 4) - 15 = [(5 \bigstar 4) + 15] - 15 =$

$= (5 \bigstar 4) + 15 - 15 = 5 \bigstar 4$

$5 \bigstar 4 = 5^2 - 4 = 25 - 4 = (21)$

9) $a^2 \blacktriangle b^3 = ab$

$a \bullet b = 2ab$

$(9 \blacktriangle 125) - (3 \bullet 1) = ?$

$9 \blacktriangle 125 = 3^2 \blacktriangle 5^3 = 3 \cdot 5 = 15$

$3 \bullet 1 = 2 \cdot 3 \cdot 1 = 6$

$15 - 6 = (9)$

10) $a \blacktriangle b = \frac{a-b}{3}$.

$a \bullet b = a^2 + b^2$

$27 \blacktriangle 9 = \frac{27-9}{3} = 6.$

$12 \blacktriangle 3 = \frac{12-3}{3} = 3.$

$6 \bullet 3 = 6^2 + 3^2 = 36 + 9 = (45)$

11) $a^2 @ b^4 = 2a - 3b$

$a^3 \bullet b^5 = 4a + 2b.$

$(25 @ 16) + (125 \bullet 32) = ?$

$25 @ 16 = 5^2 @ 2^4 = 2 \cdot 5 - 3 \cdot 2 = 10 - 6 =$

$= 4$

$125 \bullet 32 = 5^3 \bullet 2^5 = 4 \cdot 5 + 2 \cdot 2 =$

$= 20 + 4 = 24$

$4 + 24 = (28)$

$2 \blacktriangle 4 = \frac{1}{2} \blacktriangle \frac{1}{4} = 2^2 \cdot 4 = 16$

$3 \bullet 6 = \frac{1}{3} \cdot 6^2 = \frac{1}{3} \cdot 36 = 12$

$16 \blacktriangle 12 = \frac{1}{16} \blacktriangle \frac{1}{12} = 16$

$2 \blacktriangle 4 = \frac{1}{2} \blacktriangle \frac{1}{4} = \left(\frac{1}{2}\right)^2 \cdot \frac{1}{4} = \frac{1}{16}$

$3 \bullet 6 = \frac{1}{3} \cdot 6^2 = \frac{1}{3} \cdot 12 \cdot 3 = 12$

$\frac{1}{16} \blacktriangle 12 = (16)^2 \cdot \frac{1}{12} = 256 \cdot \frac{1}{12} =$

$= \frac{256}{12} = \frac{128}{6} = \boxed{\frac{64}{3}}$

13) $a^3 \blacktriangle b^2 = 3a - b$

$a^2 \blacksquare b^3 = a + 2b$

$(27 \blacktriangle 9) + (36 \blacksquare 64) = ?$

14) $a^3 \blacktriangle b = 2a^2 + b$

$a^4 \blacksquare b = 3a - b$

$5a \circ 4b = a + b.$

$(64 \blacktriangle 8) - (16 \blacksquare 2) + (25 \circ 4) = ?$

$64 \blacktriangle 8 = 4^3 \blacktriangle 8 = 2 \cdot 4^2 + 8 = 2 \cdot 16 + 8 = 40$

$16 \blacksquare 2 = 2^4 \blacksquare 2 = 3 \cdot 2 - 2 = 6 - 2 = 4$

$25 \circ 4 = 5 \cdot 5 \circ 4 \cdot 1 = 5 + 1 = 6.$

$40 - 4 + 6 = \boxed{42}$

15) $3a \blacksquare 4b = a + 2b$

$4a \blacktriangle 2b = 2a + 3b.$

$8a \circ 4b = 3a^2 + 2b.$

$(12 \blacksquare 12) - (4 \blacktriangle 18) + (16 \circ 64) = ?$

$12 \blacksquare 12 = 3 \cdot 4 \blacksquare 4 \cdot 3 = 4 + 2 \cdot 3 = 10$

$4 \blacktriangle 18 = 4 \cdot 1 \blacktriangle 2 \cdot 9 = 2 \cdot 1 + 3 \cdot 9 = 29.$

16) $3a^2 \blacksquare 4b = 2a - b$

$4a \blacktriangle 3b^3 = a + b$

$5a \circ 3b = 2a^2 + b^2$

$(27 \blacksquare 24) - (16 \blacktriangle 81) + (35 \circ 6) = ?$

$27 \blacksquare 24 = 3 \cdot 3^2 \blacksquare 4 \cdot 6 = 2 \cdot 3 - 6 = 0$

$16 \blacktriangle 81 = 4 \cdot 4 \blacktriangle 3 \cdot 3^3 = 4 + 3 = 7$

$35 \circ 6 = 5 \cdot 7 \circ 3 \cdot 2 = 2 \cdot 7^2 + 2^2 = 98 + 4 = 102.$

$0 - 7 + 102 = \boxed{95}$

17) $3a^2 \circ 8b = 2a - 3b$

$4a \triangle 3b = 2a + 4b$

$2a^2 \blacksquare 3b = \frac{2a}{b}$

$(7508) + (16 \triangle 27) - (18 \blacksquare 6) = ?$

$7508 = 3 \cdot 5^2 \circ 8 \cdot 1 = 2 \cdot 5 - 3 \cdot 1 = 7$

18) $a \circ b = a^3 - b$

$a \triangle b = \frac{a^2}{2} + b$

$a \blacksquare b = \frac{a^3}{b^2}$

$(2 \circ 4) + (4 \triangle 8) - (2 \blacksquare 1) = ?$

$2 \circ 4 = 2^3 - 4 = 4.$

$4 \triangle 8 = \frac{4^2}{2} + 8 = 16.$

$2 \blacksquare 1 = \frac{2^3}{1^2} = 8.$

$4 + 16 - 8 = \boxed{12}$

19) $a \blacktriangle b = a^2 + b^2$

$a^3 \blacksquare 4b = \frac{a}{b}$

$(1000 \blacksquare 20) \blacktriangle (125 \blacksquare 20) = ?$

Test 19

1) $a \blacktriangle b = (a \bullet b) \cdot 2$

$a \bullet b = (a * b) + 4$

$a * b = 2a + b$

$5 \blacktriangle 2 = ?$

$5 \blacktriangle 2 = (5 \bullet 2) \cdot 2$

$[5 \bullet 2] \cdot 2 = [(5 * 2) + 4] \cdot 2$

$[(5 * 2) + 4] \cdot 2 = ([2 \cdot 5 + 2] + 4) \cdot 2 = 32$

2) $a \Delta b = (a \bullet b) + 1$

$a \bullet b = (a * b) - 3$

$a * b = a \cdot b$

$4 \Delta 7 = ?$

$4 \Delta 7 = (4 \bullet 7) + 1$

$[4 \bullet 7] + 1 = [(4 * 7) - 3] + 1$

$x \Delta y = x - y$

$12 * 4 = ?$

$12 * 4 = (12 \bullet 4) - 5$

$12 \bullet 4 = [(12 \Delta 4) \cdot 3] - 5$

$[(12 \Delta 4) \cdot 3] - 5 = [(12 - 4) \cdot 3] - 5 = 19$

4) $x^2 * y = \frac{x \bullet y}{2}$

$x \bullet y = (x \blacktriangle y) + 4$

$x \blacktriangle y = 3x + y$

$25 * 15 = ?$

$25 * 15 = 5^2 * 15 = \frac{5 \bullet 15}{2} = (5 \bullet 15) \cdot \frac{1}{2}$

$\frac{5 \bullet 15}{2} = \frac{5 \blacktriangle 15}{2} + 4$

$\frac{5 \blacktriangle 15}{2} + 4 = (5 \blacktriangle 15) \cdot \frac{1}{2} + 4 =$

5) $x \Delta y = (x \bullet y) + 5$

$x \bullet y = (x * y) \cdot 3$

$x * y = x + y$

$9 \Delta 4 = ?$

$9 \Delta 4 = (9 \bullet 4) + 5$

$[9 \bullet 4] + 5 = [(9 * 4) \cdot 3] + 5$

$[9 * 4) \cdot 3] + 5 = [(9 + 4) \cdot 3] + 5 = 44$

6) $x \Delta y = (x \bullet y) \cdot 4$

$x \bullet y = (x * y) + 4$

$x * y = x^2 - y$

$2 \Delta 3 = ?$

~~$2 \Delta 3 = (2 \bullet 3) \cdot 4$~~

$(2 \bullet 3) \cdot 4 = (2 * 3) \cdot 4 + 4$

$(2 * 3) \cdot 4 + 4 = (2^2 - 3) \cdot 4 + 4 = 8$

$((2 * 3) + 4) \cdot 4 = ((2^2 - 3) + 4) \cdot 4 = 20$

7) $a @ b = (a \Delta b) - 3$

$a \Delta b = (a \bullet b) \cdot 2$

$a \bullet b = 3a - b$

$(9 \Delta 4) - (4 @ 2) = ?$

$9 \Delta 4 = (9 \bullet 4) \cdot 2$

$(9 \bullet 4) \cdot 2 = (3 \cdot 9 - 4) \cdot 2 = 46$

$4 @ 2 = (4 \Delta 2) - 3$

$(4 \Delta 2) - 3 = ((4 \bullet 2) \cdot 2) - 3$

$((4 \bullet 2) \cdot 2) - 3 = ((3 \cdot 4 - 2) \cdot 2) - 3 = 17$

$46 - 17 = 29$

~~8) $x * y = 3(a @ b)$~~

8) $x * y = 3(x \Delta y)$

$5 \star 7 = 3 \cdot (5 @ 7)$

$3 \cdot (5 @ 7) = 3 \cdot (5 \cdot (5 \Delta 7))$

$3 \cdot (5 \cdot (5 \Delta 7)) = 3 \cdot (5 \cdot (5+7)) = 180$

9) $x * y = 2(x @ y)$

$x @ y = (x \blacksquare y) + 5$

$x \blacksquare y = 2x + y$

$7 * 3 = ?$

$7 * 3 = 2(x @ y) = 2(7 @ 3)$

$2(7 @ 3) = 2((7 \blacksquare 3) + 5)$

$2 \cdot ((7 \blacksquare 3) + 5) = 34$

$= 2 \cdot ((2 \cdot 7 + 3) + 5) = 44$

10) $a @ b = 4(a \Delta b)$

$a \Delta b = 5(a - b)$

11) $a \Delta b = (a \star b) - 10$

$a \star b = 3(a \bullet b)$

$a \bullet b = \frac{a}{b}$

$24 \Delta 2 = ?$

$24 \Delta 2 = (24 \star 2) - 10$

$(24 \star 2) - 10 = (3 \cdot (24 \bullet 2)) - 10$

$(3 \cdot (24 \bullet 2)) - 10 = (3 \cdot \frac{24}{2}) - 10 = 26$

12) $x \Delta y = (x \star y) + 5$

$x \star y = (x \square y) + 12$

$x \square y = x + y^2$

$3 \Delta 4 = ?$

$3 \Delta 4 = (3 \star 4) + 5$

13) $x \blacktriangle y = (x \bullet y) + x$

$x \bullet y = y\,(x \Delta y)$

$x \Delta y = 2\,(x+y)$

$5 \blacktriangle 2 = ?$

$5 \blacktriangle 2 = (5 \bullet 2) + 5$

$(5 \bullet 2) + 5 = (2 \cdot (5 \Delta 2)) + 5$

$(2 \cdot (5 \Delta 2)) + 5 = 2 \cdot (2 \cdot (5+2)) + 5 = \boxed{33}$

14) $x @ y = 4(x \# y)$

$x \# y = (x * y) + 12$

$x * y = x + y - 5$

$4 @ 5 = ?$

$4 @ 5 = 4 \cdot (4 \# 5)$

$4 \cdot (4 \# 5) = 4 \cdot ((4 * 5) + 12)$

$4 \cdot ((4 * 5) + 12) = 4 \cdot ((4+5-5) + 12) =$

$= 4 \cdot 16 = \boxed{64}$

15) $a \# b = (a * b) + b$

$a * b = (a \bullet b) + a$

$a \bullet b = a \cdot b$

$4 \# 9 = ?$

$4 \# 9 = (4 * 9) + 9$

$(4 * 9) + 9 = ((4 \bullet 9) + 4) + 9.$

$((4 \bullet 9) + 4) + 9 = ((4 \cdot 9) + 4) + 9 = \boxed{49}$

16) $x @ y = (x \blacksquare y) + 10$

$x \blacksquare y = x\,(x \Delta y)$

$x \Delta y = 2x - y$

$5 @ 4 = ?$

$5 @ 4 = (5 \blacksquare 4) + 10$

$(5 \blacksquare 4) + 10 = (5 \cdot (5 \Delta 4)) + 10.$

$(5 \cdot (5 \Delta 4)) + 10 = 5 \cdot (2 \cdot 5 - 4) + 10 =$

$= \boxed{40}$

17) $a \Delta b = (a * b) + 7$

$a * b = 2(a \circ b)$

$a \circ b = a - b$

$18 \Delta 7 = ?$

$18 \Delta 7 = (18 * 7) + 7$

$(18 * 7) + 7 = (2 \cdot (18 \circ 7)) + 7$

$(2 \cdot (18 \circ 7)) + 7 = (2 \cdot (18 - 7)) + 7 =$

$= \boxed{29}$

18) $12a * b^3 = a \cdot b + 5$

$a^3 \circ b = a + b^2 - 1$

$(36 * 64) + (125 \circ 4) = ?$

$36 * 64 = 12 \cdot 3 * 4^3 = 3\ 4 + 5 = 17$

$125 \circ 4 = 5^3 \circ 4 = 5 + 4^2 - 1 = 20$

$17 + 20 = \boxed{37}$

Test 20

1) $x * y = 2(x \bullet y)$

$x \bullet y = 5(x + y)$

$7 * 3 = ?$

2) $a * b = (a \bullet b) - 4$

$a \bullet b = 2a - b$

$7 * 4 = ?$

$7 * 4 = (7 \bullet 4) - 4$

$(7 \bullet 4) - 4 = (2 \cdot 7 - 4) - 4 = \boxed{6}$

3) $x @ y = (x * y) + 3$

$x * y = (x \# y) + x^2$

$x \# y = x + y$

$3 @ 2 = ?$

$3 @ 2 = (3 * 2) + 3$

$(3 * 2) + 3 = ((3 \# 2) + 3^2) + 3$

$((3 \# 2) + 3^2) + 3 = ((3 + 2) + 9) + 3 = \boxed{17}$

4) $a * b = (a \bullet b) + ab$

$a \bullet b = (a \Delta b) + 1$

$10 * 9 = (10 \cdot 9) + 10 \cdot 9 = (10 \cdot 9) + 90$

$(10 \cdot 9) + 90 = ((10 \Delta 9) + 1) + 90$

$((10 \Delta 9) + 1) + 90 = ((10 - 9) + 1) + 90 =$

$= 92$

5) $a \Delta b = 2(a \cdot b)$

$a \cdot b = (a * b) \cdot 3$

$a * b = \frac{a \cdot b}{2} + 4$

$12 \Delta 4 = ?$

$12 \Delta 4 = 2 \cdot (12 \cdot 4)$

$2 \cdot (12 \cdot 4) = 2 \cdot (12 * 4) \cdot 3)$

$2 \cdot ((12 * 4) \cdot 3) = 2 \cdot (\left(\frac{12 \cdot 4}{2} + 4\right) \cdot 3) =$

$= 168$

6) $a \star b = \frac{(a * b) - 8}{2}$

$5 \star 4 = \frac{(5 * 4) - 8}{2}$

$\frac{(5 * 4) - 8}{2} = \frac{(4 \cdot (5 \cdot 4)) - 8}{2}$

$\frac{(4 \cdot (5 \cdot 4)) - 8}{2} = \frac{[4 \cdot (5^2 - 4)] - 8}{2} =$

$= \frac{4 \cdot 21 - 8}{2} = 38$

7) $x \star y = (x \cdot y) \cdot y$

$x \cdot y = (x \# y) + x^2 - 1$

$x \# y = x + y^2$

$4 \star 2 = ?$

$4 \star 2 = (4 \cdot 2) \cdot 2$

$(4 \cdot 2) \cdot 2 = ((4 \# 2) + 4^2 - 1) \cdot 2 = ((4 \# 2) + 15) \cdot 2$

$((4 \# 2) + 15) = ((4 + 2^2) + 15) \cdot 2 = 46$

$15 * 8 = (15 \bullet 8) + 10$

$(15 \bullet 8) + 10 = (10 \cdot (15 - 8)) + 10 = 80$

9) $x \blacktriangle y = (x \bullet y) + 5x$

$x \bullet y = (x * y) + 3y$

$x * y = 2x + y$

$4 \blacktriangle 5 = ?$

$4 \blacktriangle 5 = (4 \bullet 5) + 5 \cdot 4 = (4 \bullet 5) + 20$

$(4 \bullet 5) + 20 = ((4 * 5) + 3 \cdot 5) + 20$

$((4 * 5) + 15) + 20 = ((2 \cdot 4 + 5) + 15) + 20 =$

$= 48$

10) $a @ b = (a \bullet b) + 3$

$a \bullet b = (a \blacksquare b) \cdot 4$

$a \blacksquare b = a + 3b$

$7 @ 3 = ?$

$= 67$

11) $x \Delta y = (x \circ y) - xy$

$x \circ y = x^2 + y^2$

$8 \Delta 7 = ?$

$8 \Delta 7 = (8 \circ 7) - 8 \cdot 7 = (8 \circ 7) - 56$

$(8 \circ 7) - 56 = (8^2 + 7^2) - 56 = 57$

12) $a \Delta b = (a \circ b) + a^2$

$a \circ b = (a \bullet b) - 2b$

$a \bullet b = a \cdot b$

$5 \Delta 4 = ?$

$5 \Delta 4 = (5 \circ 4) + 5^2 = (5 \circ 4) + 25$

$(5 \circ 4) + 25 = ((5 \bullet 4) - 2 \cdot 4) + 25 =$

$= ((5 \bullet 4) - 8) + 25$

$((5 \bullet 4) - 8) + 25 = ((5 \cdot 4) - 8) + 25 = 37$

$8 \blacktriangle 3 = ?$

$8 \blacktriangle 3 = (8@3) + 17$

$(8@3) + 17 = ((8*3) + 8\ 3) + 17 =$

$= ((8*3) + 24) + 17$

$((8*3) + 24) + 17 = (3 \cdot 8 - 3) + 24 + 17 =$

$= 21 + 24 + 17 = 62$

14) $a * b = (a @ b) + 12$

$a @ b = (a \# b) - 3b$

$a \# b = 4a + 2b$

$10 * 12 = ?$

$10 * 12 = (10@12) + 12$

$(10@12) + 12 = ((10\#12) - 3 \cdot 12) + 12 =$

$= ((10\#12) - 36) + 12$

$(10\#12) - 36) + 12 = ((4 \cdot 10 + 2 \cdot 12) - 36) +$

$x * y = 3(x+y)$

$25 \cdot 12 = ?$

$25 \cdot 12 = 5^2 \cdot 12 = (5 \square 12) + 5 \cdot 12 =$

$= (5 \square 12) + 60$

$(5 \square 12) + 60 = ((5 * 12) + 15) + 60$

$((5*12) + 15) + 60 = ((3(5+12)) + 15) + 60 =$

$= 3 \cdot 17 + 15 + 60 = 126$

16) $x * y^3 = (x \star y) + y^2$

$x \star y = x^2 + y - 1$

$7 * 64 = ?$

$7 * 64 = 7 * 4^3 = (7 \star 4) + 4^2$

$(7 \star 4) + 4^2 = (7^2 + 4 - 1) + 4^2 = 52 + 4^2 =$

$= 52 + 16 = 68$

~~17)~~ $a * b = (a \cdot b) - 13$

$8 * 19 = (8 \circ 19) - 13$

$(8 \circ 19) - 13 = ((8 \blacktriangle 19) + 8 \cdot 19) - 13 =$

$= ((8 \blacktriangle 19) + 152) - 13$

$((8 \blacktriangle 19) + 152) - 13 = (8^2 + 19) + 152) - 13 =$

$= (75 + 152) - 13 = 214$

18) $x @ y = (x * y) \cdot 3$

$x * y = (x \circ y) + 15$

$x \circ y = x^3 + 2y$

$2 @ 18 = ?$

$2 @ 18 = (2 * 18) \cdot 3$

$(2 * 18) \cdot 3 = ((2 \circ 18) + 15) \cdot 3$

$((2 \circ 18) + 15) \cdot 3 = ((2^3 + 2 \cdot 18) + 15) \cdot 3 =$

$= 177$

19) $a * b = 10 (a \circ b)$

$10 * 20 = 10 (10 \circ 20)$

$10 (10 \circ 20) = 10 ((10 @ 20) + (10 + 20))$

$10 ((10 @ 20) + 30) =$

$= 10 \cdot ((10 \cdot 10 - 2 \cdot 10) + 30) =$

$= 10 \cdot (80 + 30) =$

Bu testlərin ən sadə variantı sondan axtarışdır. Sonuncu testləri-mizi bu üsulla edək.

17) $a * b = (a \circ b) - 13$

$a \circ b = (a \blacktriangle b) + ab$

$a \blacktriangle b = a^2 + b$

$8 * 19 = ?$

19) $a * b = 10(a \circ b)$

$a \circ b = (a @ b) + (a + b)$

$a @ b = 10a - 2b$

$10 * 20 = ?$

✓ $a @ b = 10a - 2b$.

$a @ b = 10 \cdot 10 - 2 \cdot 20$

$a @ b = 100 - 40$

$a @ b = 60$.

✓ $a \circ b = (a @ b) + (a + b)$

~~$a \circ b = 60 + (10 + 20)$~~

~~$a \circ b = 60 + 30$~~

~~$a \circ b = 90$~~

✓ $a * b = 10(a \circ b)$

~~$a * b$~~

$a \circ b = 60 + (10 + 20)$

$a \circ b = 60 + 30$

$a * b = 900$

20) $a \blacktriangle b = a \bullet (b + 1)$

$a \bullet b = (a - 1) \triangle b$

$a \triangle b = a + b + 2$

$4 \blacktriangle 3 = ?$

✓ $a \triangle b = 4 + 3 + 2$

$a \triangle b = 9$.

✓ $a \bullet b = (a - 1) \triangle b$.

$a \bullet b = (4 - 1) \triangle b$

$a \bullet b = 3 \triangle 3$.

✓ $a \blacktriangle b = a \bullet (b + 1)$

$a \blacktriangle b = 4 \bullet (3 + 1)$

$a \blacktriangle b = 4 \bullet 4$

Ravumızı əvvəldən sonra edək. O biri yolunuda yadda saxla-yaq:

20) $a \blacktriangle b = a \bullet (b+1)$

$a \bullet b = (a-1) \triangle b$

$a \triangle b = a + b + 2$

$(4 \blacktriangle 3) = ?$

$4 \blacktriangle 3 = 4 \bullet (3+1) = 4 \bullet 4$

$4 \bullet 4 = (4-1) \triangle 4 = 3 \triangle 4$

$3 \triangle 4 = 3 + 4 + 2 = 9$

Test 21

1) $a \star b = (a \bullet b) + 7$

$a \bullet b = a \cdot b$

$5 \star 2 = ?$

2) $x @ y = (x \bullet y) \cdot 2$

$x \bullet y = (x \triangle y) + 5$

$x \triangle y = x - y + 1$

$5 @ 4 = ?$

$5 @ 4 = (5 \bullet 4) \cdot 2$

$(5 \bullet 4) \cdot 2 = ((5 \triangle 4) + 5) \cdot 2$

$((5 \triangle 4) + 5) \cdot 2 = ((5 - 4 + 1) + 5) \cdot 2 =$

$= 14$

3) $5x \blacksquare y = x + 3y$

$4a \triangle b = a + b^2$

$(15 \blacksquare 7) + (16 \triangle 9) = ?$

$15 \blacksquare 7 = 3 \cdot 5 \blacksquare 7 = 5 + 3 \cdot 7 = 26$

$16 \triangle 9 = 4 \cdot 4 \triangle 9 = 4 + 9^2 = 85$

$26 + 85 = 111$

4) $a * b = \frac{(a \bullet b)}{7}$

$a \bullet b = (a \triangle b)$

$a \triangle b = a + b$

$15 * 13 = ?$

$15 * 13 = \frac{15 \bullet 13}{7}$

$\frac{15 \bullet 13}{7} = \frac{15 \triangle 13}{7}$

$\frac{15 \triangle 13}{7} = \frac{15+13}{7} = 4$

5) $12 \blacksquare y^3 = x \cdot y$

$108 \blacksquare 125 = ?$

$108 \blacksquare 125 = 12 \cdot 9 \blacksquare 5^3 = 9 \cdot 5 = 45$

$3 * 5 = (3 \bullet 5) + 6.$

$(3 \bullet 5) + 6 = (4 \cdot (3 \triangle 5)) + 6$

$(4 \cdot (3 \triangle 5)) + 6 = (4 \cdot (3^2 - 5)) + 6 =$

$= 4 \cdot 4 + 6 = 22$

7) $14x \blacklozenge 13y = x + y^2$

$5x \bullet y^2 = (x+y) \cdot 2$

$(56 \blacklozenge 39) + (10 \bullet 81) = ?$

$56 \blacklozenge 39 = 14 \cdot 4 \blacklozenge 13 \cdot 3 = 4 + 3^2 = 13$

$10 \bullet 81 = 5 \cdot 2 \bullet 9^2 = (2+9) \cdot 2 = 22$

$13 + 22 = 35$

8) $7a \blacktriangle 4b = 3(a+b)$

$a^3 \bullet 2b = a^2 - b$

$(35 \blacktriangle 16) - (64 \bullet 12) = ?$

9) $a * b = (a \bullet b) + 9$

$a \bullet b = \frac{a \Delta b}{3}$

$a \Delta b = a^2 + b$

$5 * 2 = ?$

$5 * 2 = (5 \bullet 2) + 9$

$(5 \bullet 2) + 9 = \left(\frac{5 \Delta 2}{3}\right) + 9$

$\left(\frac{5 \Delta 2}{3}\right) + 9 = \left(\frac{5^2 + 2}{3}\right) + 9 = 18$

10) $x^5 * 2y = \frac{x \cdot y}{2}$

$243 * 20 = ?$

$243 * 20 = 3^5 * 2 \cdot 10 = \frac{3 \cdot 10}{2} = 15$

10) $8a * 3b = a^2 + 4b$

$125 \bullet 36 = 5^3 \bullet 6^2 = 5 \cdot 6 = 30.$

$45 - 30 = 15$

12) $a * b = 5 \cdot (a \bullet b)$

$a \bullet b = (a \Delta b) - 1$

$a \Delta b = 2(a + b)$

$7 * 3 = ?$

$7 * 3 = 5 \cdot (7 \bullet 3)$

$5 \cdot (7 \bullet 3) = 5 \cdot ((7 \Delta 3) - 1)$

$5 \cdot ((7 \Delta 3) - 1) = 5 \cdot (((2 \cdot (7 + 3)) - 1) =$

$= 5 \cdot 19 = 95$

13) $5a * 7b = a^2 - b$

$3a^2 \bullet b = a + b^2 - 1.$

$(30 * 49) - (48 \bullet 4) = ?$

$30 * 49 = 5 \cdot 6 * 7 \cdot 7 = 6^2 - 7 = 29$

14) $a \square b = a^2 + b + 3a$

$a \bullet b = a + b^2 + ab - 1$

$(5 \square 17) - (5 \bullet 4) = ?$

$5 \square 17 = 5^2 + 17 + 3 \cdot 5 = 25 + 17 + 15 = 57$

$5 \bullet 4 = 5 + 4^2 + 5 \cdot 4 - 1 = 5 + 16 + 20 - 1 = 40$

$57 - 40 = (17)$

15) $a * b = (a \Delta b) + a$

$a \Delta b = 2(a - b)$

$16 * 8 = ?$

$16 * 8 = (16 \Delta 8) + 16$

$(16 \Delta 8) + 16 = (2(16 - 8)) + 16 = (30)$

16) $a * b = 3(a - b)$

$16 \bullet 8 = \frac{16 \cdot 8}{4} = 32.$

$7 * 4 = 3(7 - 4) = 9.$

$32 \Delta 9 = 32 + 9^2 = (113)$

17) $a \Delta b = (a \bullet b) - 1$

$a \bullet b = a^3 - b$

$4 \Delta 28 = ?$

$4 \Delta 28 = (4 \bullet 28) - 1.$

$(4 \bullet 28) - 1 = (4^3 - 28) - 1 = (35)$

18) $7\ a * b^2 = a^2 - 3b$

$4a \bullet b = a + b^2 + 1$

$(16 \bullet 5) + (21 * 1) = ?$

$16 \bullet 5 = 4 \cdot 4 \bullet 5 = 4 + 5^2 + 1 = 30.$

19) $15 \Delta 2 = 14 \nabla 16$

$7 \Delta 3 = 19 \nabla 2$

$5 \Delta 7 = 28 \nabla x$

$x = ?$

Soldakıların hasılı, sağdakıların cəmini bərabərdir.

$15 \cdot 2 = 14 + 16.$

$7 \cdot 3 = 19 + 2$

$5 \cdot 7 = 28 + x \quad (x = 7)$

20) $a * b = ab + b^2$

$a \Delta b = 3(a+b)$

$(7 * 4) \Delta 12 = ?$

$7 * 4 = 7 \cdot 4 + 4^2 = 44$

$44 \Delta 12 = 3 \cdot (44 + 12) = (168)$

$3 \star 4 = (3 \blacktriangle 4) + 5$

$(3 \blacktriangle 4) + 5 = (2 \cdot 3 - 4) + 5 = (7)$

2) $x \blacktriangle y = (x \bullet y) \cdot 4$

$x \bullet y = x - y$

$14 \blacktriangle 9 = ?$

$x \blacktriangle y = (14 \bullet 9) \cdot 4$

$(14 \bullet 9) \cdot 4 = (14 - 9) \cdot 4 = (20)$

3) $a \bullet b = (a \blacktriangle b) - 3$

$a \blacktriangle b = a^2 + b$

$5 \bullet 7 = ?$

$5 \bullet 7 = (5 \blacktriangle 7) - 3.$

$(5 \blacktriangle 7) - 3 = (5^2 + 7) - 3 = 32 - 3 =$

$= (29)$

$7 \bullet 2 = (7 \triangle 2) \cdot 7$

$(7 \triangle 2) \cdot 7 = (7 + 2^2) \cdot 7 = 77$

5) $a \blacksquare b = (a \bullet b) - ab$

$a \bullet b = a^2 + b^2$

$4 \blacksquare 6 = ?$

$4 \blacksquare 6 = (4 \bullet 6) - 4 \cdot 6 = (4 \bullet 6) - 24$

$(4 \bullet 6) - 24 = (4^2 + 6^2) - 24 = 28$

6) $a \blacksquare b = \frac{a \bullet b}{2}$

$a \bullet b = a \cdot b - 1$

$5 \blacksquare 3 = ?$

$5 \blacksquare 3 = \frac{5 \bullet 3}{2}$

$\frac{5 \bullet 3}{2} = \frac{5 \cdot 3 - 1}{2} = 7$

$7 * 5 = (7 \bullet 5) + 7$

$(7 \bullet 5) + 7 = ((7 \triangle 5) - 5) + 7$

$((7 \triangle 5) - 5) + 7 = ((7 \cdot 5) - 5) + 7 = 37$

8) $a \bullet b = (a \triangle b) + 4$

$a \triangle b = 2(a * b)$

$a * b = a + b$

$11 \bullet 9 = ?$

$11 \bullet 9 = (11 \triangle 9) + 4$

$(11 \triangle 9) + 4 = (2 \cdot (11 * 9)) + 4$

$(2 \cdot (11 * 9)) + 4 = (2 \cdot (11 + 9)) + 4 = 44$

9) $a * b = (a \blacktriangle b) + ab$

$a \blacktriangle b = (a \bullet b) - 12$

$a \bullet b = 3a - b$

$15 * 3 = ?$

$(15 \circ 3) + 33 = (3 \cdot 15 - 3) + 33 = 75$

10) $a \square b = (a * b) + 2a$

$a * b = (a \triangle b) - 7b$

$a \triangle b = a \cdot b + 1$

$5 \square 2 = ?$

$5 \square 2 = (5 * 2) + 2 \cdot 5 = (5 * 2) + 10$

$(5 * 2) + 10 = ((5 \triangle 2) - 7 \cdot 2) + 10$

$((5 \triangle 2) - 14) + 10 = ((5 \cdot 2 + 1) - 14) + 10 =$

$= 7$

11) $a \bullet b = (a \blacktriangle b) + 21$

$a \blacktriangle b = (a * b) - 3b$

$a * b = 2(a + b)$

$11 \bullet 7 = ?$

$11 \bullet 7 = (11 \blacktriangle 7) + 21$

12) $a \Delta b = (a * b) \cdot 3$

$a * b = (a \bullet b) + 7$

$a \bullet b = a - b$

$11 \Delta 2 = ?$

$11 \Delta 2 = (11 * 2) \cdot 3$

$(11 * 2) \cdot 3 = ((11 \bullet 2) + 7) \cdot 3$

$((11 \bullet 2) + 7) \cdot 3 = ((11 - 2) + 7) \cdot 3 = 48$

13) $a * b = (a \Delta b) + b$

$a \Delta b = (a \bullet b) + 4$

$a \bullet b = a + b^2$

$7 * 4 = ?$

$7 * 4 = (7 \Delta 4) + 4$

$(7 \Delta 4) + 4 = ((7 \bullet 4) + 4) + 4$

$((7 \bullet 4) + 4) + 4 = ((7 + 4^2) + 4) + 4 = 31$

$9 * 11 = (9 \bullet 11) + 11^2$

$(9 \bullet 11) + 121 = (9^2 + 11) + 121 =$

$= (181)$

15) $a \Delta b = (a \bullet b) + 7a$

$a \bullet b = (a * b) \cdot 2$

$a * b = a - b$

$7 \Delta 5 = ?$

$7 \Delta 5 = (7 \bullet 5) + 7 \cdot 7 = (7 \bullet 5) + 49$

$(7 \bullet 5) + 49 = ((7 * 5) \cdot 2) + 49$

$((7 * 5) \cdot 2) + 49 = ((7 - 5) \cdot 2) + 49 =$

$= (53)$

16) $a * b = (a \Delta b) + a^2$

$a \Delta b = (a \bullet b) - ab$

$(7 \Delta 5) + 49 = ((7 \bullet 5) - 7 \cdot 5) + 49 =$

$= (7 \bullet 5) - 35 + 49 = (7 \bullet 5) + 14$

$(7 \bullet 5) + 14 = (7^2 + 5^2) + 14 = (88)$

17) $a * b = a(a \Delta b) - 1$

$a \Delta b = (a + b) \cdot 2$

$7 * 9 = ?$

$7 * 9 = 7 \cdot (7 \Delta 9) - 1$

$7 \cdot (7 \Delta 9) - 1 = [7 \cdot ((7 + 9) \cdot 2)] - 1 =$

$= (223)$

18) $a \square b = \frac{a \circ b}{5}$

$a \circ b = (a \bullet b) - 5$

$a \bullet b = a \cdot b$

$15 \square 7 = ?$

$$\frac{(15 \bullet 7) - 5}{5} = \frac{(15 \cdot 7) - 5}{5} = 20$$

19) $a \bullet b = (a \triangle b) + 4$

$a \triangle b = (a * b) - 8$

$a * b = a^3 - b$

$4 \bullet 15 = ?$

$4 \bullet 15 = (4 \triangle 15) + 4$

$(4 \triangle 15) + 4 = ((4 * 15) - 8) + 4$

$((4 * 15) - 8) + 4 = ((4^3 - 15) - 8) + 4 =$

$= 44$

20) $a \triangle b = (a * b) - 15$

$a * b = (a \bullet b) \cdot 2$

$a \bullet b = 7a - 3b$

$7 \triangle 12 = ?$

$= ((49 - 36) \cdot 2) - 15 = 11$

21) $a * b = (a \bullet b) + 7$

$a \bullet b = 5(a \triangle b)$

$a \triangle b = 4a - b$

$7 * 12 = ?$

$7 * 12 = (7 \bullet 12) + 7$

$(7 \bullet 12) + 7 = (5 \cdot (7 \triangle 12)) + 7$

$(5 \cdot (7 \triangle 12)) + 7 = (5 \cdot (4 \cdot 7 - 12)) + 7 = 87$

Test 23

1) $a * b = (a \blacktriangle b) - 3a$

$a \blacktriangle b = (a + b) \cdot 4$

$5 * 15 = ?$

$5 * 15 = (5 \blacktriangle 15) - 3 \cdot 5 = (5 \blacktriangle 15) - 15$

$12 * 7 = ?$

$12 * 7 = (12 \bullet 7) \cdot 2$

$(12 \bullet 7) \cdot 2 = ((12-7) \cdot 3) \cdot 2 = 30$

3) $a \blacktriangle b = (a \bullet b) + b$

$a \bullet b = a \cdot b$

$7 \blacktriangle 9 = ?$

$7 \blacktriangle 9 = (7 \bullet 9) + 9$

$(7 \bullet 9) + 9 = (7 \cdot 9) + 9 = 72$

4) $a \circ b = (a \square b) + 9$

$a \square b = a^2 + b - 1$

$5 \circ 10 = ?$

$5 \circ 10 = (5 \square 10) + 9$

$(5 \square 10) + 9 = (5^2 + 10 - 1) + 9 = 43$

$12 \Delta 9 = (12 @ 9) + 3 \cdot 12$

$(12 @ 9) + 36 = (81 - 12) + 36 = 105$

6) $x \Delta y = (x \square y) + y$

$x \square y = 2x + y^2$

$5 \Delta 7 = ?$

$5 \Delta 7 = (5 \square 7) + 7$

$(5 \square 7) + 7 = (2 \cdot 5 + 7^2) + 7 = 66$

7) $a @ b = (a \# b) - 7$

$a \# b = 12a - 5b$

$4 @ 5 = ?$

$4 @ 5 = (4 \# 5) - 7$

$(4 \# 5) - 7 = (12 \cdot 4 - 5 \cdot 5) - 7 = 16$

8) $a \square b = (a * b) + 4a$

$7 \square 4 = (7 * 4) + 4 \cdot 7$

$(7 * 4) + 28 = ((7 \bullet 4) - 12) + 28 =$

$= (7 \bullet 4) + 16$

$(7 \bullet 4) + 16 = (7 \cdot 4 + 7) + 16 = 51$

9) $a * b = (a \Delta b) + 10b$

$a \Delta b = (a \bullet b) \cdot 2$

$a \bullet b = (a + b) \cdot 3$

$7 * 4 = ?$

$7 * 4 = (7 \Delta 4) + 10 \cdot 4 = (7 \Delta 4) + 40$

$(7 \Delta 4) + 40 = ((7 \bullet 4) \cdot 2) + 40$

$((7 \bullet 4) \cdot 2) + 40 = (((7 + 4) \bullet 3) \cdot 2) + 40 =$

$= 106$

10) $a @ b = (a \bullet b) \cdot 3$

$a \bullet b = (a * b) - 4b$

$10 @ 8 = (10 \bullet 8) \cdot 3$

$(10 \bullet 8) \cdot 3 = ((10 * 8) - 4 \cdot 8) \cdot 3$

$((10 * 8) - 32) \cdot 3 = ((3 \cdot 10 + 2 \cdot 8) - 32) \cdot 3 =$

$= 48$

11) $a \bullet b = (a \Delta b) - 4$

$a \Delta b = (a * b) \cdot b$

$a * b = a - b$

$9 \bullet 4 = ?$

$9 \bullet 4 = (9 \Delta 4) - 4$

$(9 \Delta 4) - 4 = ((9 * 4) \cdot 4) - 4$

$((9 * 4) \cdot 4) - 4 = ((9 - 4) \cdot 4) - 4 = 16$

12) $a \blacktriangle b = (a \bullet b) + b^3$

$a \bullet b = (a * b) - 2$

$a * b = a^2 - b$

$(7 * 2) + 6 = (7^2 - 2) + 6 =$ (53)

13) $a \square b = (a \blacktriangle b) \cdot 3$

$a \blacktriangle b = \frac{a \circ b}{2}$

$a \circ b = a \cdot b$

$12 \square 9 = ?$

$12 \square 9 = (12 \blacktriangle 9) \cdot 3$

$(12 \blacktriangle 9) \cdot 3 = \left(\frac{12 \circ 9}{2}\right) \cdot 3$

$\left(\frac{12 \circ 9}{2}\right) \cdot 3 = \frac{12 \cdot 9}{2} \cdot 3 =$ (162)

14) $a \Delta b = (a \bullet b) + b$

$a \bullet b = 7a + b^2$

$11 \Delta 5 = ?$

$11 \Delta 5 = (11 \bullet 5) + 5$

15) $2a * b = (a \Delta b) \cdot 6$

$a \Delta b = (a \bullet b) - 8$

$a \bullet b = 5a - b$

$18 * 7 = ?$

$18 * 7 = 2 \cdot 9 * 7 = (9 \Delta 7) \cdot 6$

$(9 \Delta 7) \cdot 6 = ((9 \bullet 7) - 8) \cdot 6$

$((9 \bullet 7) - 8) \cdot 6 = ((5 \cdot 9 - 7) - 8) \cdot 6 =$ (180)

16) $a @ b = (a * b) \cdot 2$

$a * b = (a \bullet b) - 7$

$a \bullet b = 3a + b$

$7 @ 12 = ?$

$7 @ 12 = (7 * 12) \cdot 2$

$(7 * 12) \cdot 2 = ((7 \bullet 12) - 7) \cdot 2$

$((7 \bullet 12) - 7) \cdot 2 = ((3 \cdot 7 + 12) - 7) \cdot 2 =$

17) $a \blacktriangle b = (a \bullet b) + 4b$

$a \bullet b = (a \bigstar b) \cdot 5$

$a \bigstar b = a + b$

$5 \blacktriangle 7 = ?$

$5 \blacktriangle 7 = (5 \bullet 7) + 4 \cdot 7 = (5 \bullet 7) + 28$

$(5 \bullet 7) + 28 = ((5 \bigstar 7) \cdot 5) + 28$

$((5 \bigstar 7) \cdot 5) + 28 = ((5+7) \cdot 5) + 28 = 88$

18) $a \square b = \frac{a \circ b}{2}$

$a \circ b = (a \blacksquare b) + 2a$

$a \blacksquare b = a \cdot b$

$6 \square 3 = ?$

$6 \square 3 = \frac{6 \circ 3}{2}$ ~~$\frac{(6 \blacksquare 3) + 2 \cdot 6}{2} = 6 \blacksquare + 12$~~

$\frac{6 \circ 3}{2} = \frac{(6 \blacksquare 3) + 2 \cdot 6}{2} = (6 \blacksquare 3) + 12$

19) $a * b = (a \bullet b) \cdot 4$

$a \bullet b = (a \bigstar b) + ab$

$a \bigstar b = 2a + b$

$4 * 5 = ?$

$4 * 5 = (4 \bullet 5) \cdot 4$

$(4 \bullet 5) \cdot 4 = ((4 \bigstar 5) + 4 \cdot 5) \cdot 4 =$

$= ((4 \bigstar 5) + 20) \cdot 4$

$((4 \bigstar 5) + 20) \cdot 4 = ((2 \cdot 4 + 5) + 20) \cdot 4 =$

$= 132$

20) $a @ b = (a \bullet b) + 5b$

$a \bullet b = (a \bigstar b) - 3a^2$

$a \bigstar b = a^3 + b^2$

$4 @ 5 = ?$

$4 @ 5 = (4 \bullet 5) + 5 \cdot 5 = (4 \bullet 5) + 25$

Test 24

1) $a \blacktriangle b = 2a + b$

$3 \blacktriangle x = 4 \blacktriangle 2$

$x = ?$

$3 \blacktriangle x = 4 \blacktriangle 2$

$2 \cdot 3 + x = 2 \cdot 4 + 2$

$6 + x = 8 + 2$

$6 + x = 10$

$x = 4$

2) $a@b = \begin{cases} a + 2b & a > b \\ 2a + b & a < b \\ a + b & a = b \end{cases}$

$((4@4)@(5@2)) = ?$

$5@2$ ifadəsinə uyğun olan şərt

$a + 2b \quad a > b$

Onda $5 + 2 \cdot 2 = 9$.

Alınan cavablarımızı yerində birləşdirsək.

$8@9$.

Yerdə qalan şərtimiz:

$2a + b \quad a < b$

~~Onda 8@9 bunu~~

Onda $2 \cdot 8 + 9 = 25$ olar.

3) $a \star b = ab + 1$

$a \blacktriangle b = a + 3b$

$a \circ b = \frac{a + b}{2}$

4) $a \blacktriangle b = a^2 + b^2 - 3a\,(a \blacktriangle b)$

$5 \blacktriangle 1 = ?$

$5 \blacktriangle 1 = 5^2 + 1^2 - 3 \cdot 5 \cdot (a \blacktriangle b)$

$5 \blacktriangle 1 = 26 - 15\,(5 \blacktriangle 1)$

$16\,(5 \blacktriangle 1) = 26$

$5 \blacktriangle 1 = \frac{26}{16}$

$5 \blacktriangle 1 = \frac{13}{8}$

5) $(a;b) \blacktriangledown (c;d) = (a \cdot b + c\,;\, c \cdot d + b)$

$(a;b) \square (c;d) = \left(\frac{a}{b} + d\,;\, \frac{c}{d} + b\right)$

$((6;2) \square (9;3)) \blacktriangledown (2,3)$

$(6;2) \square (9;3) = \left(\frac{6}{2} + 3\,;\, \frac{9}{3} + 2\right)$

6) $a \blacktriangle b = (a * b) + 3$

$a * b = (a \bullet b) - 5$

$a \bullet b = a - b$

$8 \blacktriangle 6 = ?$

$8 \blacktriangle 6 = (8 * 6) + 3$

$(8 * 6) + 3 = ((8 \bullet 6) - 5) + 3$

$((8 \bullet 6) - 5) + 3 = (8 \bullet 6) - 2 = (8 - 6) - 2 =$

$= 0$

7) $a^3 \blacktriangle b^2 = \frac{1}{a} - \frac{1}{b}$

$64 \blacktriangle 25 = ?$

$64 \blacktriangle 25 = 4^3 \blacktriangle 5^2 = \frac{1}{4} - \frac{1}{5} = \frac{1}{20}$

8) $a \blacktriangle b = (a * b) - 3a$

$a * b = (a \bullet b) + 2ab$

$5 \blacktriangle 3 = (5 * 3) - 3 \cdot 5$

$(5 * 3) - 15 = ((5 \bullet 3) + 2 \cdot 5 \cdot 3) - 15 =$

$= (5 \bullet 3) + 15$

$(5 \bullet 3) + 15 = \frac{5 \cdot 3}{5} + 15 = 18$

9) $a \Delta b = \frac{1 + a \Delta b}{a + b - 1} + a$

$\frac{1}{2} \Delta 3 = ?$

$a \Delta b = \frac{1 + a \Delta b}{a + b - 1} + a$

$a \Delta b = \frac{1 + a \Delta b}{\frac{1}{2} + 3 - 1} + \frac{1}{2}$

$a \Delta b = \frac{1 + a \Delta b}{\frac{5}{2}} + \frac{1}{2}$

$a \Delta b = \frac{2}{5} \cdot (1 + a \Delta b) + \frac{1}{2}$

$a \Delta b = \frac{4 \cdot (1 + a \Delta b) + 5}{10}$

$10(a \Delta b) = 4 \cdot (1 + a \Delta b) + 5$

$10(a \Delta b) = 4 + 4(a \Delta b) + 5$

$10(a \Delta b) = 9 + 4(a \Delta b)$

$6(a \Delta b) = 9$

$a \Delta b = \frac{9}{6}$

$a \Delta b = \frac{3}{2}$

10) $a \blacktriangle b = 4a^2 - b^2$

$a \blacktriangle 4 = 20$

$a = ?$

$a \blacktriangle 4 = 20.$

$4a^2 - 4^2 = 20$

$a = 3$

11) $a * b = 5a + 3b$

$a \bullet b = 4a - b$

$a \blacktriangle b = 3a + 2b$

$5 * (8 \bullet (4 \blacktriangle 5)) = ?$

$4 \blacktriangle 5 = 3 \cdot 4 + 2 \cdot 5 = 22$

$8 \bullet 22 = 4 \cdot 8 - 22 = 10$

$5 * 10 = 5 \cdot 5 + 3 \cdot 10 = 55$

12) $a * b = \frac{a^2 - b^2}{2}$

$a \bullet b = \frac{a \cdot b}{2}$

$(5 * 3) \bullet (10 * 8) = ?$

$5 * 3 = \frac{5^2 - 3^2}{2} = 8.$

13) $a * b = \frac{a \bullet b}{2}$

$a \bullet b = (a \blacktriangle b) \cdot 3$

$a \blacktriangle b = \frac{a \cdot b}{4}$

$5 * 4 = ?$

$5 * 4 = \frac{5 \bullet 4}{2}$

$\frac{5 \bullet 4}{2} = \frac{(5 \blacktriangle 4) \cdot 3}{2}$

$\frac{(5 \blacktriangle 4) \cdot 3}{2} = \frac{\frac{5 \cdot 4}{4} \cdot 3}{2} = \frac{15}{2}$

14) $a \square b = 2ab - 3(a \square b)$

$4 \square 2 = ?$

$a \square b = 2ab - 3(a \square b)$

$a \square b = \frac{ab}{2}$

$a \square b = \frac{4 \cdot 2}{2}$

$a \square b = 4$

15) $a * b = (a \bullet b) - a$

$a \bullet b = (a \blacktriangle b) + b$

$a \blacktriangle b = 2a + b$

$2 * 8 = ?$

$2 * 8 = (2 \bullet 8) - 2$

$(2 \bullet 8) - 2 = ((2 \blacktriangle 8) + 8) - 2 =$

$= (2 \blacktriangle 8) + 6$

$(2 \blacktriangle 8) + 6 = (2 \cdot 2 + 8) + 6 = 18$

16) $\begin{cases} 2a+b ; & a < b \\ ab & a \geq b \end{cases}$ bu şərtə əsasən

$4 \triangle 3$ ifadəsi 12 olar. $4 \cdot 3 = 12$.

Daha sonra

$12 \triangle 14$ ifadəsi, $2a+b ; a < b$

ifadəsi $2 \cdot 12 + 14 = 38$ olar.

17) $(a,b) * (c,d) = (a \cdot c, b \cdot d)$

$(a,b) \blacksquare (c,d) = (b+c, a+d)$

$((4,3) \blacksquare (2,5)) * (6,4)$

$((4,3) \blacksquare (2,5)) = (3+2, 4+5) = (5,9)$

$(5,9) * (6,4) = (5 \cdot 6, 9 \cdot 4) = (30,36)$

18) $a * b = 5 \cdot (a \blacktriangle b)$

$a \blacktriangle b = 4 \cdot (a \bullet b)$

$a \bullet b = ab - 1$

$5 \cdot (4 \cdot (8 \bullet 3)) = 5 \cdot (4 \cdot (8 \cdot 3 - 1)) =$

$= (460)$

19) $a * b = \frac{1}{a} + \frac{1}{b}$

$a \blacktriangle b = \frac{1}{b} - \frac{1}{a}$

$(5 \blacktriangle 3) * (4 * 2) = ?$

$5 \blacktriangle 3 = \frac{1}{3} - \frac{1}{5} = \frac{2}{15}$

$4 * 2 = \frac{1}{4} + \frac{1}{2} = \frac{3}{4}$

$\frac{2}{15} * \frac{3}{4} = \frac{15}{2} + \frac{4}{3} = \frac{45+8}{6} = (\frac{53}{6})$

Test 25

1) $a @ b = a \square 2b$

$4 @ 6 = 4 \square 2 \cdot 3$

$4 \square 3 = 2 \cdot 2 \bullet 3$

$2 \bullet 3$

$4 @ 6 = 4 \square 2 \cdot 6 = 4 \square 12$

$4 \square 12 = 2 \cdot 4 \bullet 12 = 8 \bullet 12$

$8 \bullet 12 = \frac{8+12}{2}$

$8 \bullet 12 = (10)$

2) $a @ b = 2a \blacktriangle 3b$

$a * b = a - 2b$

$a \blacktriangle b = 3a * 2b$

$12 @ 4 = ?$

$12 @ 4 = 2 \cdot 12 \blacktriangle 3 \cdot 4 = 24 \blacktriangle 12$

$79 * 24 = 79 - 2 \cdot 24 = 24$

3) $(a \blacktriangle b) * c = (a + b^2) * c$

$(a * b) \Delta c = (3(a+b)) \Delta c$

$(a \Delta b) = 2 \cdot (a+b)$

$(4 \blacktriangle 3) * (7 \Delta 5) = ?$

$7 \Delta 5 = 2 \cdot (7+5) = 24$

$(4 \blacktriangle 3) * 24 = (4 + 3^2) * 24 = 13 * 24$

$13 * 24$

4) $a \blacksquare b = (a \cdot b) - a$

$a * b = a^2 - b$

$a \star b = a + 3b$

$(5 \blacksquare 2) * (3 \star 6) = ?$

$5 \blacksquare 2 = (5 \cdot 2) - 5 = 5$

$3 \star 6 = 3 + 3 \cdot 6 = 21$

$5 * 21 = 5^2 - 21 = 4$

5) $a @ b = 2a + b^2$

$a \# b = a^2 - a^b$

$a \blacktriangle b = \frac{a \cdot b}{3}$

$(3 @ 4) \blacktriangle (4 \# 1) = ?$

$3 @ 4 = 2 \cdot 3 + 4^2 = 22$

$4 \# 1 = 4^2 - 4^1 = 12$

$22 \blacktriangle 12 = \frac{22 \cdot 12}{3} = 88$

$a \blacktriangle b = 2a + 3b$

$(4 \blacksquare 6) \blacktriangle (2 \# 3) = ?$

$4 \blacksquare 6 = 4^2 - 2 \cdot 6 = 4$

$2 \# 3 = 2^3 + 3 = 11$

$4 \blacktriangle 11 = 2 \cdot 4 + 3 \cdot 11 = 41$

7) $a @ b = \frac{1}{a} + \frac{1}{b}$

$a * b = a \cdot \frac{1}{b}$

$a \blacktriangle b = a - b.$

$(x @ y) \blacktriangle (y * x) = ?$

$x @ y = \frac{1}{x} + \frac{1}{y} = \frac{y+x}{xy}$

$y * x = y \cdot \frac{1}{x} = \frac{y}{x}$

8) $x \bullet y = x^2 - y$

$y \square x = y + x - 1$

$x \Delta y = \frac{x}{y} + 1.$

$(a \bullet b) \square (b \Delta a) = ?$

$a \bullet b = a^2 - b$

$b \Delta a = \frac{b}{a} + 1.$

$(a^2 - b) \square \left(\frac{b}{a} + 1\right) = a^2 - b + \frac{b}{a} + 1 - 1 =$

$= a^2 - b + \frac{b}{a} = \frac{a^3 - ba + b}{a}$

9) $\frac{6}{1 + \left(\frac{1}{a \Delta b}\right)} = a \cdot \frac{1}{b}$

$\frac{3}{2} \Delta \frac{1}{2} = ?$

$$\frac{6}{1+\left(\frac{1}{a \Delta b}\right)} = \frac{a}{b}$$

$$\frac{6}{1+\left(\frac{1}{a} \Delta \frac{1}{b}\right)} = \frac{a}{b}$$

$$\frac{6}{1+\left(\frac{1}{a} \Delta \frac{1}{b}\right)} = \frac{\frac{3}{2}}{\frac{1}{2}}$$

$$\frac{6}{1+\left(\frac{1}{a} \Delta \frac{1}{b}\right)} = 3$$

$$3\left(1+\left(\frac{1}{a} \Delta \frac{1}{b}\right)\right) = 6$$

$$1+\left(\frac{1}{a} \Delta \frac{1}{b}\right) = 2$$

$$\frac{1}{a} \Delta \frac{1}{b} = 1$$

11) $abcd\star = x$

$a+b+c+d = x$

12) $abc\square = x$

$a \cdot b \cdot c = x$

13) $ab@cd = x$

$(a-b)+(c-d) = x$

14) $a@b = x$

$(a-1)\cdot b = x$

15) $a@b = x$

$(a+b)\cdot 3 = x$

16) $6\cdot(8+3) = 66$

17) $abcd = xy$

$a+b = x$

$c-d = y$

xy