

① IF $x=4$ Evaluate $(x+1)(x+2)$ SATMUL
011416

- (a) 10 (b) 0 (c) 30 (d) 40

② IF $A=3B$, $C=2A$, $B=7$ then find C .

- (a) $C=12$ (b) $C=22$ (c) $C=42$ (d) $C=0$

③ IF $\frac{x+5x+6x}{3} = 12$ then find x .

- (a) $x=1$ (b) $x=2$ (c) $x=3$ (d) $x=4$

④ IF $A=\{1, 2, 3, 4\}$ and $B=\{3, 4, 5, 6\}$ then find $A \cap B$.

- (a) $\{1, 2, 3, 4, 5, 6\}$ (b) $\{2, 4, 6\}$ (c) $\{3, 4\}$ (d) $\{4\}$

⑤ Find the distance between the two points $(-4, -3)$ and $(6, -3)$.

- (a) $d=5$ (b) $d=11$ (c) $d=10$ (d) $d=20$

⑥ IF $3x^2=4y=24$ then find x^2y .

- (a) $x^2y=20$ (b) $x^2y=40$ (c) $x^2y=48$ (d) $x^2y=11$

⑦ IF the radius of circle A is 2, circle B is 4, circle C is 4 then find the sum of the diameters of circles A, B, and C.

- (a) 80 (b) 40 (c) 20 (d) 30

8 Find X.



- (a) $X = 62$ (b) $X = 22$ (c) $X = 32$ (d) $X = 42$

9 If $(2x-9)(2x+9) = 5$ find $4x^2$.

- (a) $4x^2 = 36$ (b) $4x^2 = 0$ (c) $4x^2 = 86$ (d) $4x^2 = 76$

10 If $3a+4b = b$ find $8a+8b$.

- (a) $8a+8b = 15$ (b) $8a+8b = 10$ (c) $8a+8b = 0$ (d) $8a+8b = 12$

11 If $f(x) = ka^x$, $f(0) = \frac{1}{2}$, $f(1) = 4$ find k and a.

- (a) $k = \frac{1}{4}$, $a = 8$ (b) $k = \frac{1}{4}$, $a = 10$ (c) $k = \frac{1}{2}$, $a = 8$ (d) $k = \frac{1}{2}$, $a = 4$

12 If $x+y = 19$ find x and y.

$$4x+5y = 84$$

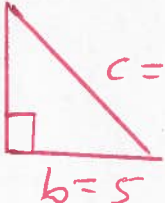
- (a) $(x, y) = (11, 4)$ (b) $(x, y) = (0, 8)$ (c) $(x, y) = (11, 8)$ (d) $(x, y) = (10, 8)$

13 If $x+3y = 12$ find y.

- (a) $y = \frac{1}{3}x + 3$ (b) $y = \frac{1}{2}x + 1$ (c) $y = -\frac{1}{3}x + 4$ (d) $y = \frac{1}{3}x - 4$

14 Factor GCF of $8m^2 + 8m + 8$.

- (a) $8(m^2 - m - 8)$ (b) $8(m^2 + 8m + 8)$ (c) $8(m^2 + m + 1)$ (d) $8(m^2 + m + 8)$

15) If $a=5$  $c=x$ $b=5$ Find x .

- (a) $x = 2\sqrt{2}$ (b) $x = 7$ (c) $x = 5\sqrt{2}$ (d) $x = 6\sqrt{2}$

16) If $\frac{2}{5} = \frac{12}{m}$ Find m .

- (a) $m = 40$ (b) $m = 20$ (c) $m = 30$ (d) $m = 10$

17) If $|x-3| = \frac{1}{4}$ Find x .

- (a) $\left\{\frac{11}{4}, -\frac{13}{4}\right\}$ (b) $\left\{-\frac{11}{4}, -\frac{13}{4}\right\}$ (c) $\left\{\frac{11}{4}, \frac{13}{4}\right\}$ (d) $\left\{\frac{11}{2}, \frac{13}{2}\right\}$

18) If $g(x) = k(x+2)(x-2)$, $k > 0$, $g(a-1.2) = 0$
then find a .

- (a) $\{-0.8, 5.2\}$ (b) $\{-0.4, 3.2\}$ (c) $\{-0.8, 3.2\}$ (d) $\{-0.8, -3.2\}$

19) If $f(x, y, z) = x^y - xz + z$, find $f(5, 2, 3)$.

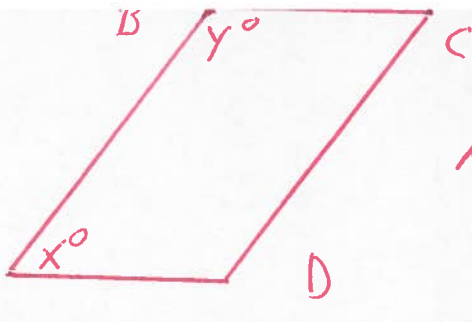
- (a) $f(5, 2, 3) = 10$ (b) $f(5, 3, 3) = 17$ (c) $f(5, 2, 3) = 13$ (d) $f(5, 2, 3) = 16$

20) Find the area of the square with opposite vertices at $(-4, -4)$ and $(4, 4)$.

- (a) area = 100 (b) area = 25 (c) area = 64 (d) area = 16

21.

If



$\overline{AD} \parallel \overline{BC}$ then find $10(x+y)$.

- (a) 360 (b) 18 (c) 1800 (d) 180

22.

If $3^{2x} \cdot 3^{2y} = 81$ find $x+y$.

- (a) $x+y=11$ (b) $x+y=4$ (c) $x+y=2$ (d) $x+y=3$

23.

If $k = \frac{x}{3}$ and $x \neq 0$ find $9x$ in terms of k .

- (a) $9x = 13k$ (b) $9x = 11k$ (c) $9x = 27k$ (d) $9x = 5k$

24.

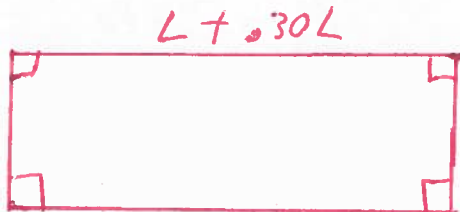
A cube has 2 faces painted red.

If the total of the other faces is 64 square inches then find the volume of the cube.

- (a) $V = 81$ (b) $V = 27$ (c) $V = 64$ (d) $V = 32$

25.

If



find area

- (a) $A = 2.21LW$ (b) $A = 2.91LW$ (c) $A = .91LW$ (d) $A = .81LW$

26) If $f(x) = \frac{x^2}{2} - 20x + k$ find $f(10)$ 5

- (a) $f(10) = -100 + k$ (b) $f(10) = 200 + k$ (c) $f(10) = -150 + k$ (d) $f(10) = 150 + k$

27) If the interior and exterior of a truck are to be painted different colors and there are 5 different colors then how many are possible?

- (a) 50 (b) 30 (c) 20 (d) 10

28) If $f(x) = 2x + 2$ find $f(10)$.

- (a) $f(10) = 0$ (b) $f(10) = 70$ (c) $f(10) = 22$ (d) $f(10) = 12$

29) If $\frac{24}{60} = \frac{x}{5}$ then find x .

- (a) $x = 10$ (b) $x = 6$ (c) $x = 2$ (d) $x = 4$

30) If $2x + 3 = 10$ find $8x$.

- (a) $8x = 25$ (b) $8x = 10$ (c) $8x = 28$ (d) $8x = 14$

31) If $a < 0$ then which of the four numbers is the greatest, a , $10a$, $20a$, or $30a$?

- (a) $30a$ (b) $20a$ (c) a (d) $10a$

32) If $(x-2)^2 = 36$ find x .

- (a) $\{2, 36\}$ (b) $\{2, 4\}$ (c) $\{-4, 8\}$ (d) $\{-4, -8\}$

33. If $m = t^8$, $w = m^2 + m$, find w in terms of t .

- (a) $w = t^{16} + t^{11}$ (b) $w = t^{20} + t^3$ (c) $w = t^{16} + t^8$ (d) $w = t^{16} + t^2$

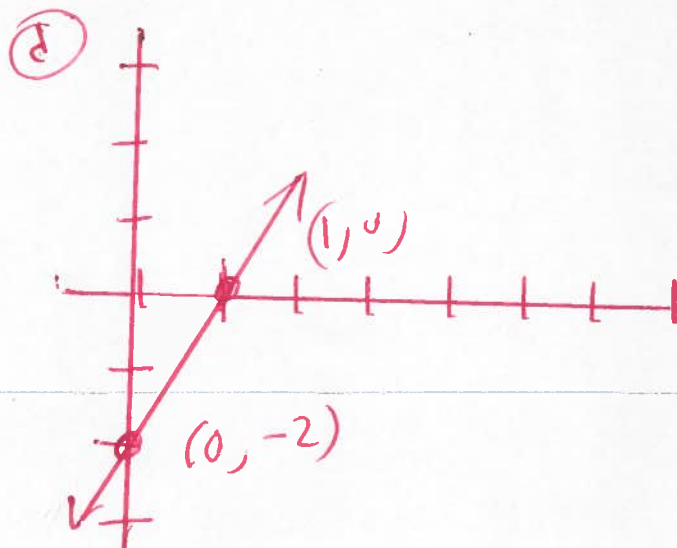
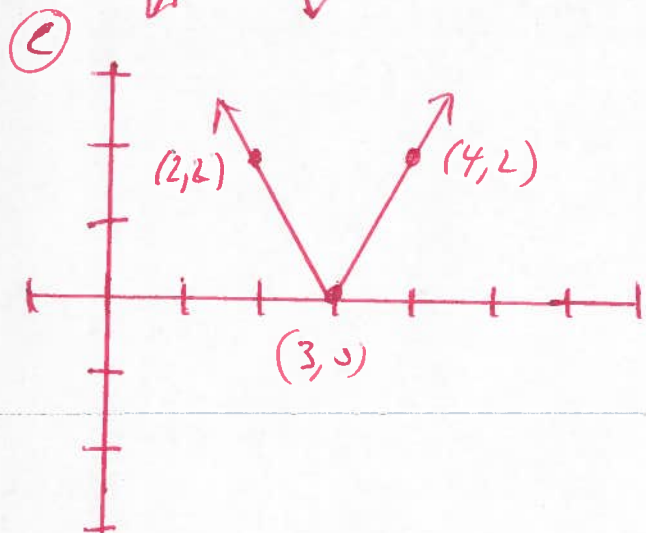
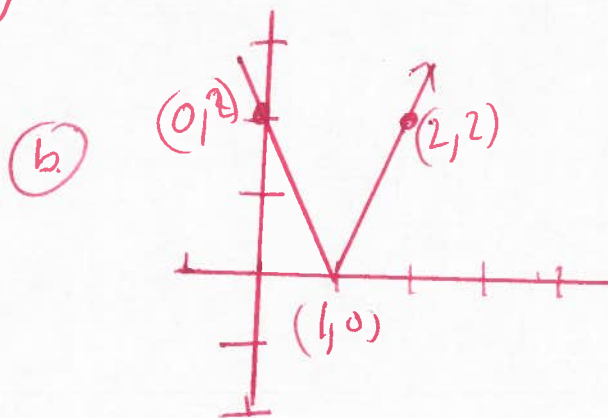
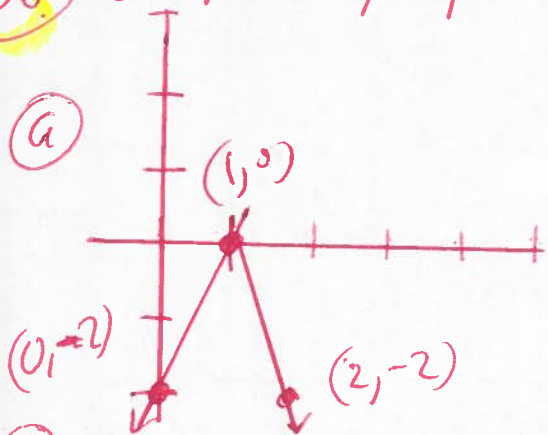
34. If $f(x) = (x-1)(x+1)$ find $f(6) - f(5)$.

- (a) 10 (b) 13 (c) 11 (d) 12

35. If $\frac{x^2}{y}$ is an integer and $\frac{x}{y}$ is not an integer then find x, y .

- (a) $(x, y) = (7, 3)$ (b) $(x, y) = (3, 2)$ (c) $(x, y) = (6, 4)$ (d) $(x, y) = (1, 2)$

36. Graph $y = |-2x + 6|$



37. If $x^2 = 4y^2$ find x, y .

$$x = 1 + 2y$$

- (a) $(x, y) = (\frac{1}{3}, -\frac{2}{3})$ (b) $(x, y) = (2, -4)$ (c) $(x, y) = (\frac{1}{2}, -\frac{1}{4})$ (d) $(x, y) = (-\frac{1}{2}, -\frac{1}{4})$

38. If $V = LWH$, $L = d$, $w = d$, $H = k$

find V in terms of d and k .

- (a) $V = d^3 k^3$ (b) $V = d^2 k^2$ (c) $V = d^2 k$ (d) $V = dk^2$

39. Find the equation of the line with point $(2, 1)$ and slope $= m = -2$.

- (a) $y = 4x - 5$ (b) $y = -2x - 5$ (c) $y = -2x + 5$ (d) $y = 2x - 5$

40. If $y = -2x + 5$ and $x = 0$ then find y .

- (a) $(x, y) = (0, -2)$ (b) $(x, y) = (5, 0)$ (c) $(x, y) = (0, 5)$ (d) $(x, y) = (1, 0)$

41. If $3x = 0$ then evaluate $11 + x + x^2$.

- (a) 22 (b) 10 (c) 11 (d) 13

42. If the average of n_1, n_2, n_3, n_4 is 3 then what is the average of $2n_1, 2n_2, 2n_3, 2n_4$.

- (a) 14 (b) 2 (c) 6 (d) 8

43) If $\frac{7}{16} = \frac{y}{x}$ and $y = 3.5$ find x .

- (a) $x = 10$ (b) $x = 5$ (c) $x = 8$ (d) $x = 3$

44) If $k + n < k$ find n .

- (a) $n > 1$ (b) $n < 2$ (c) $n < 0$ (d) $n > 0$

45) If $f(x) = 2x^2 + 2$ find $f(3)$.

- (a) $f(3) = 0$ (b) $f(3) = 1$ (c) $f(3) = 20$ (d) $f(3) = 10$

46) If $f(x) = \frac{2}{3}x^2 + 2$ find $f(3)$.

- (a) $f(3) = 11$ (b) $f(3) = \frac{1}{4}$ (c) $f(3) = 8$ (d) $f(3) = 7$

47) Simplify $8 \div \frac{1}{4}$.

- (a) 5 (b) 2 (c) 32 (d) 16

48) If $\frac{3x+y}{y} = \frac{6}{5}$ find $\frac{x}{y}$.

- (a) $\frac{x}{y} = \frac{3}{5}$ (b) $\frac{x}{y} = 7$ (c) $\frac{x}{y} = \frac{1}{15}$ (d) $\frac{x}{y} = \frac{1}{5}$

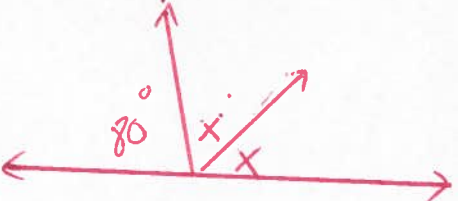
49) If $f(x) = |3x - 17|$ find $f(6)$.

- (a) $f(6) = 4$ (b) $f(6) = -1$ (c) $f(6) = 1$ (d) $f(6) = 3$

50. If $\frac{90}{15} = \frac{1}{x}$ find x .

9

- (a) $x = 5$ (b) $x = \frac{1}{3}$ (c) $x = \frac{1}{6}$ (d) $x = \frac{1}{5}$

51. If  Find x .

- (a) $x = 70$ (b) $x = 40$ (c) $x = 50$ (d) $x = 60$

52. If x is an odd integer then find the next two odd integers.

- (a) $\{x+2, x+6\}$ (b) $\{x+1, x+4\}$ (c) $\{x+2, x+4\}$ (d) $\{x+1, x+2\}$

53. If $(x+y)^2 = 100$ and $(x-y)^2 = 16$ find $2xy$.

- (a) $2xy = 10$ (b) $2xy = 82$ (c) $2xy = 42$ (d) $2xy = 40$

54. If $-1 \leq 4x - 5$ find x .

- (a) $x \leq 5$ (b) $x \geq 5$ (c) $x \geq 1$ (d) $x \leq 1$

55. If n is a positive integer and $2^n + 2^{n+1} = k$ then find 2^{n+2} in terms of k .

- (a) $2^{n+2} = \frac{5k}{3}$ (b) $2^{n+2} = \frac{k}{7}$ (c) $2^{n+2} = \frac{4k}{3}$ (d) $2^{n+2} = \frac{3k}{4}$

56. If $y = x - 5$ and $20y - 5y = 150$, find x .

- (a) $x = 30$
- (b) $x = 3$
- (c) $x = 15$
- (d) $x = 10$

57. A bag has 4 blue, 3 red, and 2 yellow pens. If one pen is drawn at random then what is the probability that the pen is yellow?

- (a) $\frac{8}{9}$
- (b) $\frac{4}{9}$
- (c) $\frac{2}{9}$
- (d) $\frac{5}{9}$

58. If $6x + 4 = 7$ find $6x - 4$.

- (a) 4
- (b) -3
- (c) -1
- (d) -2

59. If $P(t) = 3000(2)^{\frac{t}{4}}$ find $P(16)$.

- (a) $P(16) = 58000$
- (b) $P(16) = 800$
- (c) $P(16) = 48000$
- (d) $P(16) = 480$

60. If $\frac{3+x+y}{3} = 6$ find $x+y$.

- (a) $x+y = 12$
- (b) $x+y = 6$
- (c) $x+y = 15$
- (d) $x+y = 17$

61. If t and k are positive integers, $t > k$, $t^2 - k^2 < 6$, $t+k > 4$ find t .

- (a) $(t, k) = (5, 11)$
- (b) $(t, k) = (1, 7)$
- (c) $(t, k) = (3, 2)$
- (d) $(t, k) = (2, 3)$

62) Find $\frac{1}{2}$ of 29% of 618.

- (a) 88.88 (b) 88.61 (c) 89.61 (d) 89.71

63) If $g(x) = f(3x+1)$, $f(5) = -3$, $f(6) = 4$, $f(7) = -5$ then find $g(2)$.

- (a) $g(2) = -11$ (b) $g(2) = 7$ (c) $g(2) = -5$ (d) $g(2) = -6$

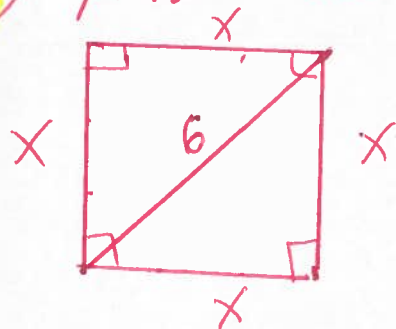
64) If $f(x, y) = f(x) + f(y)$ and $a = b$ find $f(a+b)$.

- (a) $f(a+b) = 4f(a)$ (b) $f(a+b) = 11f(a)$ (c) $f(a+b) = 2f(a)$ (d) $f(a+b) = 7f(a)$

65) If $f(x+y) = f(x) + f(y)$ and $a = b$ find $f(b) + f(b)$.

- (a) $f(b) + f(b) = f(3a)$ (b) $f(b) + f(b) = f(10a)$ (c) $f(b) + f(b) = f(2a)$ (d) $f(b) + f(b) = f(a)$

66) Find the area of the square.



- (a) area = 87 (b) area = 30 (c) area = 18 (d) area = 20

67) If $x \neq 0$, x is inversely proportional to y , what is y^2 directly proportional to. (12)

- (a) $y^2 = \frac{k}{x^3}$ (b) $y^2 = \frac{k}{x}$ (c) $y^2 = \frac{k^2}{x^2}$ (d) $y^2 = k^2 x^2$

68) If $(x-8)(x-k) = x^2 - 5kx + m$ find m .

- (a) $m = 44$ (b) $m = 20$ (c) $m = 16$ (d) $m = 12$

69) If $10^{ab} = 10000$ and a and b are positive integers then what is the value of a .

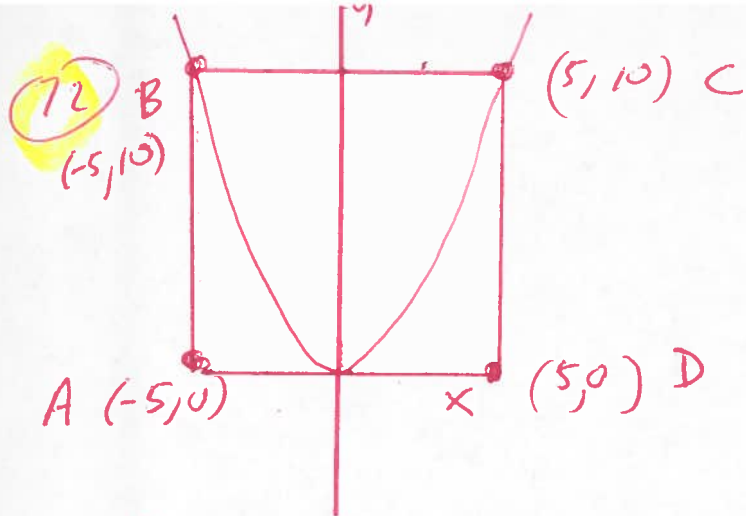
- (a) $a \in \{2, 4\}$ (b) $a \in \{1, 2, 3, 4\}$ (c) $a \in \{1, 2, 4\}$ (d) $a \in \{1, 2\}$

70) If $2x - 3y = c$, $(x, y) = (8, -1)$ then find c .

- (a) $c = 4$ (b) $c = 10$ (c) $c = 19$ (d) $c = 18$

71) If $5x = x + 5$ then find x .

- (a) $x = \frac{3}{4}$ (b) $x = \frac{3}{5}$ (c) $x = \frac{5}{4}$ (d) $x = \frac{4}{5}$



13

If ABCD is a square with area of 100 and graph $y = ax^2$ then find a .

- (a) $a = -\frac{2}{5}$ (b) $a = \frac{4}{5}$ (c) $a = \frac{2}{5}$ (d) $a = \frac{3}{5}$

73. If $\frac{3}{4}x = 18$ then find $\frac{1}{4}x$.

- (a) $\frac{1}{4}x = 30$ (b) $\frac{1}{4}x = 10$ (c) $\frac{1}{4}x = 6$ (d) $\frac{1}{4}x = 12$

74. If $f(x) = x(x-1)$ find $f(5)$.

- (a) $f(5) = 0$ (b) $f(5) = 30$ (c) $f(5) = 20$ (d) $f(5) = 10$

75. If $\sqrt{3} = x+1$ find $(x+1)^2$.

- (a) 10 (b) 2 (c) 3 (d) 4

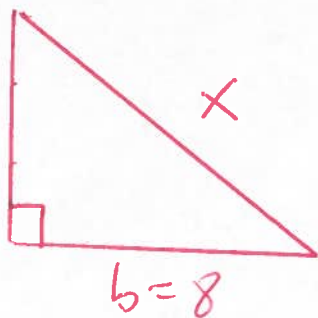
76. If $|6-5y| > 20$ find y .

- (a) $y < -\frac{14}{5}$ or $y > \frac{26}{5}$ (b) $y < \frac{1}{3}$ or $y > \frac{26}{5}$

- (c) $y < -\frac{14}{5}$ or $y > \frac{26}{5}$ (d) $y < -\frac{13}{3}$ or $y > \frac{26}{5}$

77) IF

$$a=6$$



find the perimeter. 19

(a) 10

(b) 18

(c) 24

(d) 22

78) IF $2x+5=3kx+5$ find k .

(a) $k = \frac{1}{2}$

(b) $k = \frac{3}{2}$

(c) $k = \frac{2}{3}$

(d) $k = -\frac{2}{3}$

79) For the different integers the sum

$$N_1 + N_2 + N_3 + N_4 + N_5 + N_6 + N_7 + N_8 = 0$$

what is the least number of integers that must be positive.

(a) six

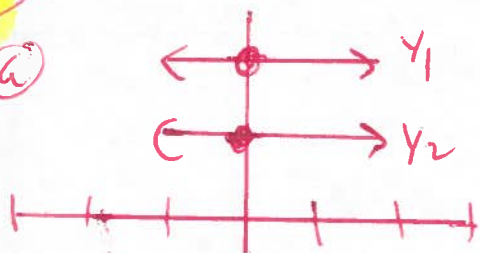
(b) eight

(c) one

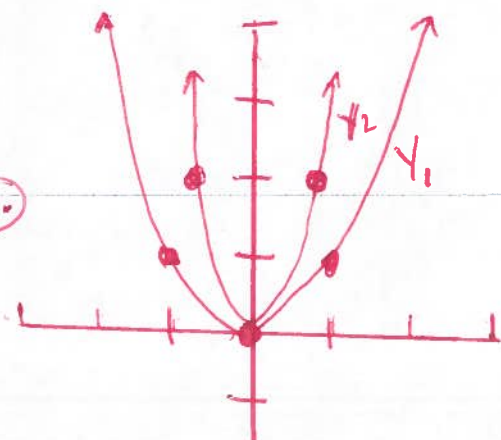
(d) two

80) Graph $y_1 = x^2$ and $y_2 = 2x^2$.

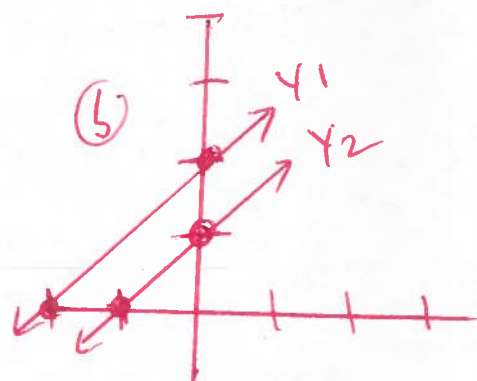
(a)



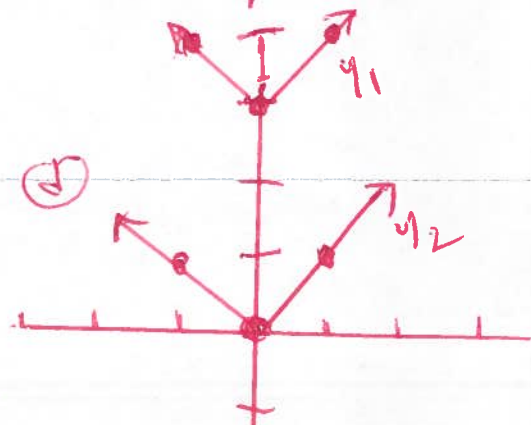
(c)



(b)



(d)



① If $x=4$ evaluate $(x+1)(x+2)$.

② If $A=3B$, $C=2A$, $B=7$ find C .

③ If $\frac{x+5x+6x}{3}=12$ find x .

1

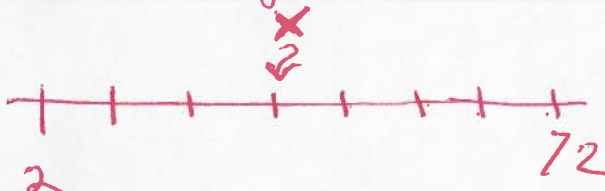
SAT 102415

④ If $A=\{1,2,3,4\}$ and $B=\{3,4,5,6\}$ find $A \cap B$.

⑤ Find the distance between the points $(-4,-3)$ and $(6,-3)$.

⑥ If $3x^2=4y=24$ find x^2y .

⑦ If the radius of circle A is 2, circle B is 4, circle C is 4 then find the sum of the diameters of circles A, B, and C.

⑧  Find the value of x

⑨ If $(2x-9)(2x+9)=5$ find $4x^2$.

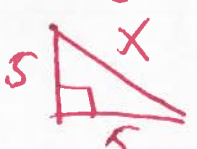
⑩ If $3a+4b=6$ find $8a+8b$.

⑪ If $f(x)=ka^x$, $f(0)=\frac{1}{2}$, $f(1)=4$, then find k, a .

⑫ $x+y=19$
 $4x+5y=84$ find x and y .

⑬ If $x+3y=12$ find y .

⑭ Factor GCF $8m^2+8m+8$

⑮ If  find x .

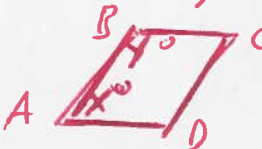
⑯ $\frac{2}{5} = \frac{12}{m}$ find m .

17) If $|x-3| = \frac{1}{4}$ find x .

18) If $g(x) = k(x+2)(x-2)$, $k > 0$, $g(a-1, 2) = 0$
then find a .

19) If $f(x, y, z) = x^y - xz + z$ find $f(5, 2, 3)$.

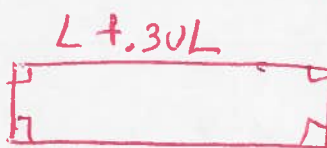
20) Find the area of the square with opposite vertices at $(-4, -4)$ and $(4, 4)$.

21) If  and $\overline{AD} \parallel \overline{BC}$ then find $10(x+y)$.

22) If $3^{2x} \cdot 3^{2y} = 81$ find $x+y$.

23) If $k = \frac{x}{3}$ and $x \neq 0$ find $9x$.

24) A cube has 2 faces painted red. If the total of the other faces is 64 square inches then find the volume of the cube.

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27) If the interior and exterior of a truck are to be painted different colors and there are 5 different colors then how many are possible.

28) If $f(x) = 2x + 2$ find $f(10)$.

29) $\frac{24}{60} = \frac{x}{5}$

30) If $2x + 3 = 10$ find $8x$.

2

31. If $a < 0$ which of the four numbers is the greatest. $a, 10a, 20a, 30a$?

32. If $(x-2)^2 = 36$ then find x .



33. If $m = t^8$, $w = m^2 + m$ find w in terms of t .

34. If $f(x) = (x-1)(x+1)$ find $f(6) - f(5)$.

35. If $\frac{x^2}{y}$ is an integer and $\frac{x}{y}$ is not an integer

then is $(x, y) = (6, 4)$ a solution?

36. Graph $y = |-2x + 6|$

37. $x^2 = 4y^2$ find x, y .

$$x = 1 + 2y$$

38. If $V = LWH$, $L = d$, $W = d$, $H = k$, find V .

Terms of d, k

39. Find the equation of the line with point $(2, 1)$ and slope $= -2$.

40. If $y = -2x + 5$ find y if $x = 0$.

41. If $3x = 0$ then evaluate $11 + x + x^2$.

42. If the average of n_1, n_2, n_3, n_4 is 3 then what is the average of $2n_1, 2n_2, 2n_3, 2n_4$.

43. If $\frac{7}{16} = \frac{y}{x}$ and $y = 3.5$ then find x .

44. If $k + n < k$ find n .

(45) If $f(x) = 2x^2 + 2$ find $f(3)$

(46) If $f(x) = \frac{2}{3}x^2 + 2$ find $f(3)$

(47) simplify $8 \div \frac{1}{4}$

4

(48) If $\frac{3x+y}{y} = \frac{6}{5}$ find $\frac{x}{y}$.

(49) If $f(x) = |3x - 17|$ find $f(6)$

(50) ~~15~~ $\frac{90}{15} = \frac{1}{x}$

(51)  find x .

(52) If x is an odd integer then find the next two odd integers.

(53) If $(x+y)^2 = 100$ and $(x-y)^2 = 16$ find $2xy$.

(54) If $-1 \leq 4x - 5$ find x .

(55) If n is a positive integer $2^n + 2^{n+1} = k$
then find 2^{n+2} in terms of k .

(56) If $y = x - 5$ and $20y - 5y = 150$ find x

(57) A bag has 4 blue, 3 red, and 2 yellow pens. If one pen is drawn then what is the probability that the pen is yellow?

(58) If $6x + 4 = 7$ find $6x - 4$.

(59) If $P(t) = 3000(2)^{\frac{t}{4}}$ find $f(16)$

(60) If $\frac{3+x+y}{3} = 6$ find $x+y$.

(61) If $t > k$, $t^2 - k^2 < 6$, $t+k > 4$ find t .

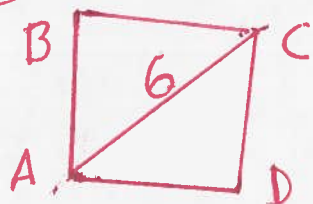
(62) Find $\frac{1}{2}$ of 29% of 618.

(63) If $g(x) = f(3x+1)$, $f(5) = -3$, $f(6) = 4$, $f(7) = -5$, then find $g(2)$.

(64) If $f(x+y) = f(x) + f(y)$ and $a = b$ then show $f(a+b) = 2f(a)$.

(65) If $f(x+y) = f(x) + f(y)$ and $a = b$ then show $f(b) + f(b) = f(2a)$.

(66) Find the area of the square.



(67) If $x \neq 0$, x is inversely proportional to y , then show $\frac{1}{x^2}$ is directly proportional to y^2 .

(68) If $(x-8)(x-k) = x^2 - 5kx + m$ find m

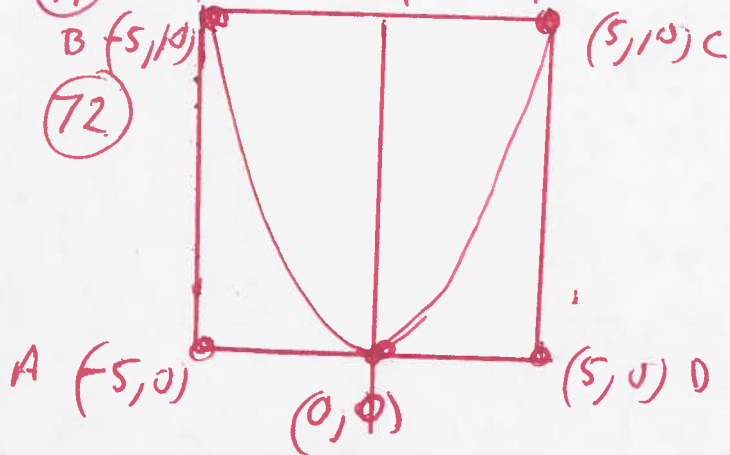
54

t and k are positive integers.

69) If $10^{ab} = 10000$ where a and b are positive integers then what are the possible values of a ?

70) If $2x - 3y = c$, $(x, y) = (8, -1)$ then find c .

71) If $5x = x + 5$ then find x .



ABCD is a square with area of 100.
If $y = ax^2$ then find a .

73) $\frac{3}{4}x = 18$ then find $\frac{1}{4}x$.

74) If $f(x) = x(x-1)$ find $f(5)$.

75) If $\sqrt{3} = x+1$ find $(x+1)^2$.

76) If $|6-5y| > 20$ find y .

77) If $a=6$  find the perimeter.

78) If $2x+5 = 3kx+5$ find k .

79) For the different integers the sum $N_1 + N_2 + N_3 + N_4 + N_5 + N_6 + N_7 + N_8 = 0$ then what is the least number of integers that must be positive.

80) Graph $y_1 = x^2$ and $y_2 = 2x^2$

① IF $x=4$ evaluate $(x+1)(x+2)$

①

$$\begin{aligned}(x+1)(x+2) &= \\ ((4)+1)((4)+2) &= \\ (4+1)(4+2) &= \\ (5)(6) &= \\ 30 &= \end{aligned}$$

② IF $A=3B$, $C=2A$, $B=7$ then find C .

$$\begin{aligned}A &= 3B \\ A &= 3(7) \\ A &= 21\end{aligned}$$

$$\begin{aligned}C &= 2A \\ C &= 2(21)\end{aligned}$$

$$C = 42$$

③ IF $\frac{x+5x+6x}{3} = 12$

$$\frac{1x+5x+6x}{3} = 12$$

$$\frac{12x}{3} = 12$$

$$4x = 12$$

$$\frac{4x}{4} = \frac{12}{4}$$

$$x = 3$$

④ If $A = \{1, 2, 3, 4\}$ and $B = \{3, 4, 5, 6\}$ find $A \cap B$.

$$A \cap B = \{3, 4\}$$

⑤ Find the distance between the two points $(-4, -3)$ and $(6, -3)$

$$d = \sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$d = \sqrt{((-4) - (6))^2 + ((-3) - (-3))^2}$$

$$d = \sqrt{(-4 - 6)^2 + (-3 + 3)^2}$$

$$d = \sqrt{(-10)^2 + (0)^2}$$

$$d = \sqrt{100 + 0}$$

$$d = \sqrt{100}$$

$$d = 10$$

⑥ If $3x^2 = 4y = 24$ find $x^2 y$.

$$3x^2 = 24$$

$$\frac{3x^2}{3} = \frac{24}{3}$$

$$x^2 = 8$$

$$4y = 24$$

$$\frac{4y}{4} = \frac{24}{4}$$

$$y = 6$$

$$x^2 y =$$

$$(8)(6) =$$

$$48 =$$

⑦ If the radius of circle A is 2, circle B is 4, circle C is 4 then find the sum of the diameters of circles A, B, and C.



$$r = 2$$

$$d = 2r$$

$$d = 2(2)$$

$$d = 4$$



$$r = 4$$

$$d = 2r$$

$$d = 2(4)$$

$$d = 8$$



$$r = 4$$

$$d = 2r$$

$$d = 2(4)$$

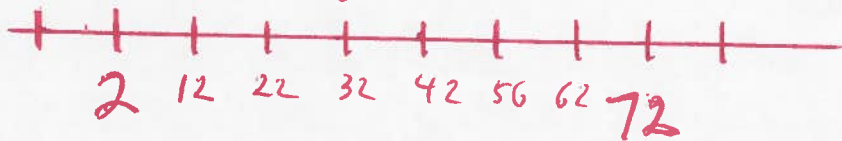
$$d = 8$$

$$4 + 8 + 8 =$$

$$20 =$$

⑧

X
↓



$$\frac{72 - 2}{7} =$$

$$\frac{70}{7} =$$

$$10 = \text{space}$$

$$X = 32$$

9) If $(2x-9)(2x+9)=5$ find $4x^2$

$$(2x-9)(2x+9)=5$$

$$4x^2 + 18x - 18x - 81 = 5$$

$$4x^2 - 81 = 5$$

$$4x^2 - 81 + 81 = 5 + 81$$

$$4x^2 = 86$$

10

10) If $3a+4b=b$ find $8a+8b$

$$3a+4b=b$$

$$3a+4b-b=b-b$$

$$3a+3b=0$$

$$\frac{3a}{3} + \frac{3b}{3} = \frac{0}{3}$$

$$a+b=0$$

$$8(a+b) = 8(0)$$

$$8a+8b=0$$

11) If $f(x) = ka^x$, $f(0) = \frac{1}{2}$, $f(1) = 4$, find k and a .

$$f(x) = ka^x$$

$$f(0) = ka^0 = \frac{1}{2}$$

$$f(0) = k(1) = \frac{1}{2}$$

$$f(0) = k = \frac{1}{2}$$

$$k = \frac{1}{2}$$

$$f(x) = \frac{1}{2}a^x$$

$$f(1) = \frac{1}{2}a^1 = 4$$

$$f(1) = \frac{a}{2} = 4$$

$$\frac{a}{2} = 4$$

$$2\left(\frac{a}{2}\right) = 2(4)$$

$$a = 8$$

$$f(x) = \frac{1}{2}(8)^x$$

(12) $x+y=19$ find x and y .
 $4x+5y=84$

$$(x+y)(-5) = 19(-5)$$

$$(4x+5y)(1) = 84(1)$$

$$\begin{array}{r} -5x-5y = -95 \\ 4x+5y = 84 \\ \hline \end{array}$$

$$\begin{array}{r} -5x-5y = -95 \\ 4x+5y = 84 \\ \hline \end{array}$$

$$-1x = -11$$

$$\frac{-1x}{-1} = \frac{-11}{-1}$$

$$x=11$$

$$x+y=19$$

$$(11)+y=19$$

$$11+y=19$$

$$11+y-x=19-11$$

$$y=8$$

$$(x, y) = (11, 8)$$

(13) If $x+3y=12$ find y .

$$x+3y=12$$

$$x+3y-x = 12-x$$

$$3y = 12-x$$

$$\frac{3y}{3} = \frac{12}{3} - \frac{x}{3}$$

$$y = 4 - \frac{1}{3}x$$

$$y = -\frac{1}{3}x + 4$$

14) Factor GCF

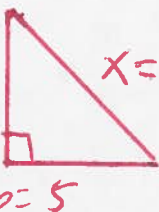
$$8m^2 + 8m + 8 =$$

$$8(m^2 + m + 1) =$$

12

15.

If $a=5$ $b=5$ $x=c$ find x .



$$a^2 + b^2 = c^2$$

$$(5)^2 + (5)^2 = c^2$$

$$25 + 25 = c^2$$

$$50 = c^2$$

$$\sqrt{50} = \sqrt{c^2}$$

$$\sqrt{25 \cdot 2} = c$$

$$\sqrt{25} \sqrt{2} = c = x$$

$$5\sqrt{2} = x$$

16) $\frac{2}{5} = \frac{12}{m}$ find m

$$2(m) = 5(12) \quad \text{cross mult}$$

$$2m = 60$$

$$\frac{2m}{2} = \frac{60}{2}$$

$$m = 30$$

(17) If $|x-3| = \frac{1}{4}$ find x .

$$|x| = a$$

$$x = -a \text{ OR } x = a$$

(3)

$$x-3 = -\frac{1}{4} \text{ OR } x-3 = \frac{1}{4}$$

$$x-3+3 = -\frac{1}{4}+3 \text{ OR } x-3+3 = \frac{1}{4}+3$$

$$x = -\frac{1}{4} + \frac{3}{1}\left(\frac{4}{4}\right) \text{ OR } x = \frac{1}{4} + \frac{3}{1}\left(\frac{4}{4}\right)$$

$$x = -\frac{1}{4} + \frac{12}{4} \text{ OR } x = \frac{1}{4} + \frac{12}{4}$$

$$x = \frac{-1+12}{4} \text{ OR } x = \frac{1+12}{4}$$

$$x = \frac{11}{4}$$

$$\text{OR } x = \frac{13}{4}$$

(18) If $g(x) = k(x+2)(x-2)$, $k > 0$, $g(a-1.2) = 0$ then find a .

$$g(x) = k(x+2)(x-2)$$

$$g(a-1.2) = k((a-1.2)+2)((a-1.2)-2) = 0$$

Let $k \neq 0$ OR $(a-1.2+2) = 0$ OR $(a-1.2-2) = 0$

$$a-1.2+2.0 = 0 \text{ OR } a-1.2-2.0 = 0$$

$$a+.8 = 0 \text{ OR } a-3.2 = 0$$

$$a+.8-.8 = 0-.8 \text{ OR } a-3.2+3.2 = 0+3.2$$

$$a = -.8$$

$$\text{OR } a = 3.2$$

(19) If $f(x, y, z) = x^2 - xz + z$

$$f(5, 2, 3) = (5)^2 - (5)(3) + (3)$$

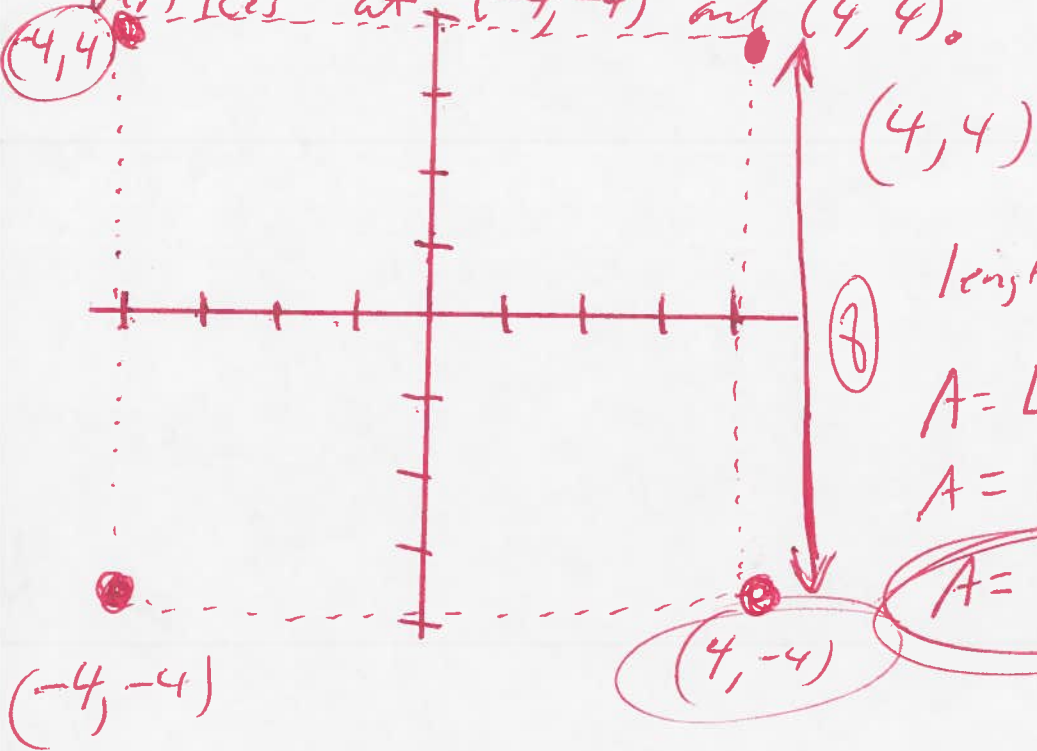
$$f(5, 2, 3) = (5)(5) - (5)(3) + 3$$

$$f(5, 2, 3) = 25 - 15 + 3$$

$$\rightarrow f(5, 2, 3) = 10 + 3$$

$$f(5, 2, 3) = 13$$

20 Find the area of the square with opposite vertices at $(-4, -4)$ and $(4, 4)$.



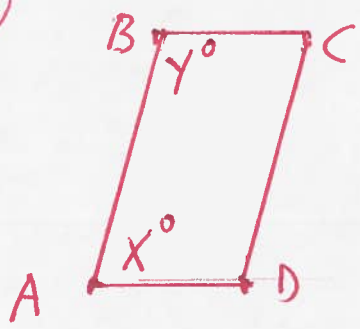
length = 8 width = 8

$$A = L \cdot W$$
$$A = (8)(8)$$

$$A = 64$$

14

21



$\overline{AD} \parallel \overline{BC}$ then find $10(x+y)$.

$$x+y = \frac{1}{2}(360)$$

$$x+y = 180$$

$$10(x+y) = 10(180)$$

$$10(x+y) = 1800$$

(22) If $3^{2x} \cdot 3^{2y} = 81$ find $x+y$.

$$3^{2x} \cdot 3^{2y} = 81$$

$$3^{2x+2y} = 81$$

$$3^{2x+2y} = 3^4$$

$$2x+2y = 4$$

$$\frac{2x}{2} + \frac{2y}{2} = \frac{4}{2}$$

$$x+y = 2$$

(23) If $k = \frac{x}{3}$ and $x \neq 0$ find $9x$. Terms of k

$$k = \frac{x}{3}$$

$$3(k) = 3\left(\frac{x}{3}\right)$$

$$3k = x$$

$$9(3k) = 9(x)$$

$$27k = 9x$$

26) If $f(x) = \frac{x^2}{2} - 20x + k$ find $f(10)$

$$f(10) = \frac{(10)^2}{2} - 20(10) + k$$

$$f(10) = \frac{(10)(10)}{2} - 20(10) + k$$

$$f(10) = \frac{100}{2} - 20(10) + k$$

$$f(10) = 50 - 200 + k$$

$$f(10) = -150 + k$$

26

27) If the interior and exterior of a truck are to be painted different colours and there are 5 different colours then how many are possible?

$$(5)(4) = (\text{inside}) * (\text{outside})$$
$$20 =$$

28) If $f(x) = 2x + 2$ find $f(10)$

$$f(10) = 2(10) + 2$$

$$f(10) = 20 + 2$$

$$f(10) = 22$$

29) $\frac{24}{60} = \frac{x}{5}$ cross mult

$$5(24) = 60(x)$$

$$120 = 60x$$

$$\frac{120}{60} = \frac{60x}{60}$$

$$2 = x$$

$$\begin{array}{r} 2 \\ 24 \\ \times 5 \\ \hline 120 \end{array}$$

30) If $2x+3=10$ find $8x$.

$$2x+3=10$$
$$2x+3-3=10-3$$

$$2x=7$$

$$\frac{2x}{2} = \frac{7}{2}$$

$$x = \frac{7}{2}$$

$$8x =$$

$$8\left(\frac{7}{2}\right) =$$

$$4(7) =$$

$$28$$

31) If $a < 0$ which of the four numbers is the greatest, $a, 10a, 20a, 30a$?

$$\text{let } a = -1$$

$$(-1), 10(-1), 20(-1), 30(-1)$$

$$-1, -10, -20, -30$$

$$-30 < -20 < -10 < -1$$

arrange

Greatest

is a

(or -1)

32) If $(x-2)^2 = 36$ find x

$$\sqrt{(x-2)^2} = \pm\sqrt{36}$$

$$x-2 = \pm 6$$

$$x-2 = -6 \quad \text{OR} \quad x-2 = 6$$

$$x-2+2 = -6+2 \quad \text{OR} \quad x-2+2 = 6+2$$

$$x = -4$$

$$\text{OR } x = 8$$

33) If $m = t^8$, $w = m^2 + m$, find w in terms of t .

$$w = m^2 + m$$

$$w = (t^8)^2 + (t^8)$$

$$w = t^{16} + t^8$$

19

34) If $f(x) = (x-1)(x+1)$ find $f(6) - f(5)$.

$$f(6) - f(5) =$$

$$(6-1)(6+1) - (5-1)(5+1) =$$

$$(5)(7) - (4)(6) =$$

$$35 - 24 =$$

$$11 =$$

35) If $\frac{x^2}{y}$ is an integer and $\frac{x}{y}$ is not an integer then show $(x, y) = (6, 4)$ is a solution.

$$\frac{x^2}{y} =$$

$$\frac{(6)^2}{4} =$$

$$\frac{(6)(6)}{4} =$$

$$\frac{36}{4} =$$

9 = integer

$$\frac{x}{y} =$$

$$\frac{6}{4} =$$

$$\frac{\cancel{2}(3)}{\cancel{2}(2)} =$$

$\frac{3}{2}$

Not an integer

36 graph $y = |-2x+6|$

$$y = |-2(2)+6|$$

$$y = |-4+6| \quad y = |-2(3)+6|$$

$$y = |2| \quad y = |-6+6|$$

$$y = 2 \quad y = |0|$$

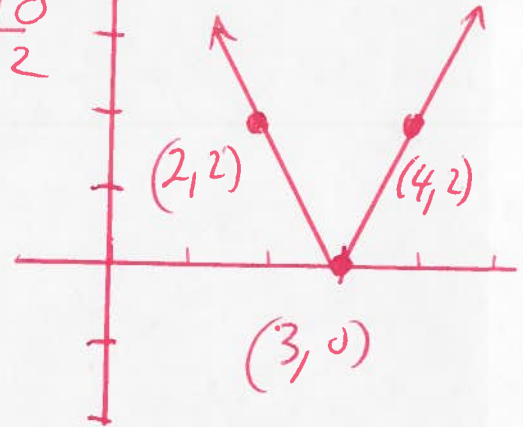
$$y = 0 \quad y = |-2(4)+6|$$

$$y = |-8+6|$$

$$y = |-2|$$

$$y = 2$$

X	y
2	2
3	0
4	2



37 $x^2 = 4y^2$ Solve

$x = 1+2y$ subst

$$(1+2y)^2 = 4y^2$$

$$(1+2y)(1+2y) = 4y^2$$

$$1+2y+2y+4y^2 = 4y^2$$

$$1+4y+4y^2 = 4y^2$$

$$1+4y+4y^2-\cancel{4y^2} = 4y^2-\cancel{4y^2}$$

$$1+4y = 0$$

$$1+4y-x = 0-1$$

$$4y = -1$$

$$\frac{4y}{4} = \frac{-1}{4}$$

$$y = -\frac{1}{4}$$

$$(x, y) = \left(\frac{1}{2}, -\frac{1}{4}\right)$$

Subst

$$x = 1+2y$$

$$x = 1+2\left(-\frac{1}{4}\right)$$

$$x = 1 - \frac{2}{4}$$

$$x = \frac{2}{2} - \frac{2}{4}$$

$$x = \frac{2}{2} - \frac{1}{2}$$

$$x = \frac{2-1}{2}$$

$$x = \frac{1}{2}$$

38) If $V = LWH$, $L = d$, $W = d$, $H = k$
find V in terms of d and k

21.

$$V = LWH$$

$$V = (d)(d)(k)$$

$$V = d^2 k$$

39) Find the equation of the line with the point $(2, 1)$ and slope $= -2$.

$$y - y_1 = m(x - x_1)$$

$$y - (1) = -2(x - (2))$$

$$y - 1 = -2(x - 2)$$

$$y - 1 = -2x + 4$$

$$y - 1 + 1 = -2x + 4 + 1$$

$$y = -2x + 5$$

40) If $y = -2x + 5$ find y if $x = 0$.

$$y = -2(0) + 5$$

$$y = 0 + 5$$

$$y = 5$$

$$(x, y) = (0, 5)$$

41. If $3X=0$ then Evaluate $11+X+X^2$

$$3X=0$$

$$\frac{3X}{3} = \frac{0}{3}$$

$$X=0$$

Subst

$$11+X+X^2=$$

$$11+(0)+(0)^2=$$

$$11+0+(0)(0)=$$

$$11+0+0=$$

$$11=$$

22

42. If the average of N_1, N_2, N_3, N_4 is 3 then what is the average of $2N_1, 2N_2, 2N_3, 2N_4$.

$$\frac{N_1+N_2+N_3+N_4}{4} = 3$$

$$2 \left(\frac{N_1+N_2+N_3+N_4}{4} \right) = 2(3)$$

$$\frac{2N_1+2N_2+2N_3+2N_4}{4} = 6$$

43. If $\frac{7}{16} = \frac{y}{x}$ and $y=3.5$ find x .

$$\frac{7}{16} = \frac{3.5}{x}$$

Cross Mult

$$7(x) = 16(3.5)$$

$$7x = 56$$

$$\frac{7x}{7} = \frac{56}{7}$$

$$x=8$$

$$\begin{array}{r} 16 \\ \times 3.5 \\ \hline 80 \\ 48 \\ \hline 56.0 \end{array}$$

44) If $k+n < k$ find n

$$k+n-k < k-k$$

$$n < 0$$

23

45) If $f(x) = 2x^2 + 2$ find $f(3)$

$$f(3) = 2(3)^2 + 2$$

$$f(3) = 2(3)(3) + 2$$

$$f(3) = 2(9) + 2$$

$$f(3) = 18 + 2$$

$$f(3) = 20$$

46) If $f(x) = \frac{2}{3}x^2 + 2$ find $f(3)$

$$f(3) = \frac{2}{3}(3)^2 + 2$$

$$f(3) = \frac{2}{3}(3)(3) + 2$$

$$f(3) = \frac{2}{3}(9) + 2$$

$$f(3) = 2(3) + 2$$

$$f(3) = 6 + 2$$

$$f(3) = 8$$

47) Simplify $8 \div \frac{1}{4} =$

$$\frac{8}{1} \div \frac{1}{4} =$$

$$\frac{8}{1} \cdot \frac{4}{1} =$$

$$\begin{array}{l} \rightarrow \frac{32}{1} = \\ \downarrow \\ \textcircled{32} = \end{array}$$

(48) If $\frac{3x+y}{y} = \frac{6}{5}$ find $\frac{x}{y}$

(29)

$$\frac{3x+y}{y} = \frac{6}{5}$$

$$\frac{3x}{y} + \frac{y}{y} = \frac{6}{5}$$

$$\frac{3x}{y} + 1 = \frac{6}{5}$$

$$\frac{3x}{y} + \cancel{1} - 1 = \frac{6}{5} - 1$$

$$\frac{3x}{y} = \frac{6}{5} - \frac{5}{5}$$

$$\frac{3x}{y} = \frac{6-5}{5}$$

$$\frac{3x}{y} = \frac{1}{5}$$

$$\frac{1}{3} \left(\frac{3x}{y} \right) = \frac{1}{3} \left(\frac{1}{5} \right)$$

$$\frac{x}{y} = \frac{1}{15}$$

(49) If $f(x) = |3x-17|$ find $f(6)$

$$f(6) = |3(6)-17|$$

$$f(6) = |18-17|$$

$$f(6) = |1|$$

$$f(6) = 1$$

(50) $\frac{90}{15} = \frac{1}{x}$ cross mult \rightarrow

(25)

$$90(x) = 15(1)$$

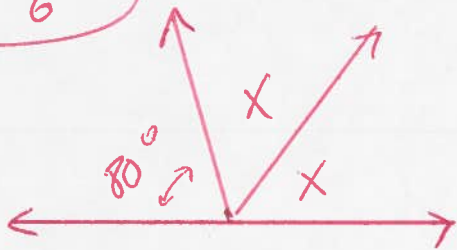
$$90x = 15$$

$$\frac{90x}{90} = \frac{15}{90}$$

$$x = \frac{15(1)}{15(6)}$$

$$x = \frac{1}{6}$$

(51)



Find X

$$80 + x + x = 180$$

$$80 + 2x = 180$$

$$80 + 2x - 80 = 180 - 80$$

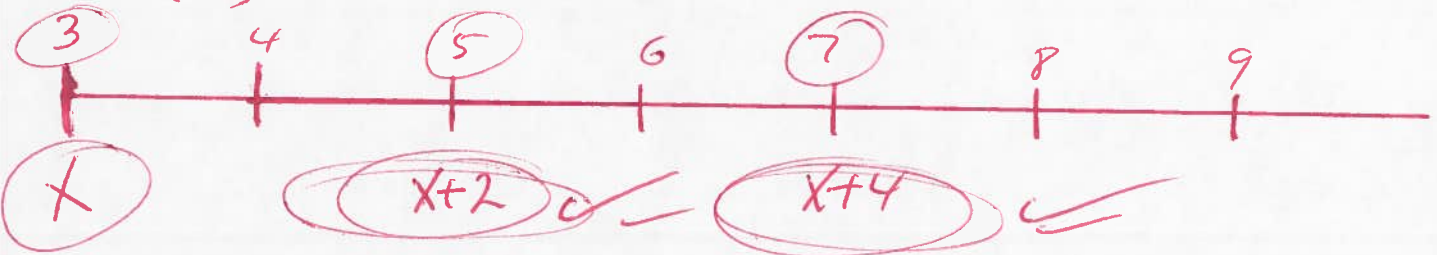
$$2x = 100$$

$$\frac{2x}{2} = \frac{100}{2}$$

$$x = 50$$

(52) If x is an odd integer then find the next two odd integers

example \rightarrow



5) IF $(x+y)^2=100$ and $(x-y)^2=16$ find $2xy$

26

$$(x+y)^2=100$$

$$(x-y)^2=16$$

$$(x+y)(x+y)=100$$

$$(x-y)(x-y)=16$$

$$x^2+xy+xy+y^2=100$$

$$x^2-xy-xy+y^2=16$$

$$x^2+2xy+y^2=100$$

$$x^2-2xy+y^2=16$$

$$(x^2+2xy+y^2)(1)=100(1) \text{ Mult}$$

$$(x^2-2xy+y^2)(-1)=16(-1)$$

$$x^2+2xy+y^2=100$$

$$-x^2+2xy-y^2=-16$$

$$4xy=84$$

$$\frac{4xy}{4}=\frac{84}{4}$$

$$xy=21$$

$$2(xy)=2(21)$$

$$2xy=42$$

subst

$$\begin{array}{r} 21 \\ \hline 4 \overline{) 84} \\ \underline{-(84)} \\ 0 \end{array}$$

(54) IF $-1 \leq 4x - 5$ find x

$$-1 \leq 4x - 5$$

$$-1 + 5 \leq 4x - 5 + 5$$

$$4 \leq 4x$$

$$\frac{4}{4} \leq \frac{4x}{4}$$

$$1 \leq x$$

(27)

(OK) $x \geq 1$



$[1, \infty)$

(55) IF n is a positive integer $2^n + 2^{n+1} = k$
then find 2^{n+2} in terms of k .

$$2^n + 2^{n+1} = k$$

$$2^n + 2^n \cdot 2^1 = k$$

$$2^n(1 + 2^1) = k$$

$$2^n(1 + 2) = k$$

$$2^n(3) = k$$

$$\frac{2^n(3)}{3} = \frac{k}{3}$$

$$2^n = \frac{k}{3}$$

$$2^n \cdot (2) = \frac{k}{3} (2^2) \text{ Mult}$$

$$2^{n+2} = \frac{k}{3} (2)(2)$$

$$2^{n+2} = \frac{k}{3} (4)$$

$$2^{n+2} = \frac{4k}{3}$$

(56) If $y = x - 5$ and $20y - 5y = 150$ find x

$$20y - 5y = 150$$

$$15y = 150$$

$$\frac{15y}{15} = \frac{150}{15}$$

$$y = 10$$

$$y = x - 5$$

$$10 = x - 5$$

$$10 + 5 = x - 5 + 5$$

$$15 = x$$

(57) A bag has 4 blue, 3 red, and 2 yellow pens. If one pen is drawn at random then what is the probability that the pen is yellow.

yellow

blue + red + yellow =

2

4 + 3 + 2 =

$$\frac{2}{9} =$$

(58) If $6x+4=7$ find $6x-4$

$$6x+4=7$$

$$6x+4-4=7-4$$

$$6x=3$$

$$\frac{6x}{6} = \frac{3}{6}$$

$$x = \frac{3}{6}$$

$$x = \frac{3(1)}{3(2)}$$

$$x = \frac{1}{2}$$

$$6x-4=$$

$$6\left(\frac{1}{2}\right)-4=$$

$$\frac{6}{2}-4=$$

$$3-4=$$

$$-1$$

(59) If $P(2) = 3000(2)^{\frac{16}{4}}$ find $P(16)$

$$P(16) = 3000(2)^{\frac{16}{4}}$$

$$P(16) = 3000(2)^4$$

$$P(16) = 3000(2)(2)(2)(2)$$

$$P(16) = 3000(16)$$

$$P(16) = 48,000$$

$$\begin{array}{r} 16 \\ \times 3000 \\ \hline 48000 \end{array}$$

29

60. If $\frac{3+x+y}{3} = 6$ find $x+y$.

30

$$\frac{3+x+y}{3} = 6$$

$$3\left(\frac{3+x+y}{3}\right) = 3(6)$$

$$3+x+y = 18$$

$$3+x+y-3 = 18-3$$

$$x+y = 15$$

61. If $t > k$, $t^2 - k^2 < 6$, $t+k > 4$ find t .

possible

$$(2, 1) \in (t, k)$$

$$(3, 1) (3, 2) \downarrow$$

$$(4, 1) (4, 2) (4, 3)$$

t and k are positive integers

only $(t, k) = (3, 2)$ works

$$t > k \checkmark$$

$$3 > 2$$

$$t^2 - k^2 < 6$$

$$(3)^2 - (2)^2 < 6$$

$$9 - 4 < 6$$

$$5 < 6 \checkmark$$

$$t+k > 4$$

$$3+2 > 4$$

$$5 > 4 \checkmark$$

$t = 3$

$t = 3$

(62) Find $\frac{1}{2}$ of 29% of 618

(31)

$$\frac{1}{2} (29\%) (618) =$$

$$\frac{1}{2} (.29) (618) =$$

$$\frac{(.29)(618)}{2} =$$

$$(.29)(309) =$$

$$89.61$$

$$\begin{array}{r} 309 \\ 2 \overline{) 618} \\ \underline{-(6)} \\ 18 \\ \underline{-(18)} \\ 0 \end{array} \quad \begin{array}{r} 309 \\ \times .29 \\ \hline 2781 \\ 618 \\ \hline 89.61 \end{array}$$

(63) If $g(x) = f(3x+1)$, $f(5) = -3$, $f(6) = 4$, $f(7) = -5$, then find $g(2)$.

$$g(x) = f(3x+1)$$

$$g(2) = f(3(2)+1)$$

$$g(2) = f(6+1)$$

$$g(2) = f(7)$$

$$g(2) = -5$$

(64) If $f(x+y) = f(x) + f(y)$ and $a = b$ then show $f(a+b) = 2 \cdot f(a)$

$$f(a+b) = f(a) + f(b)$$

$$f(a+b) = f(a) + f(a) \quad \text{since } a = b$$

$$f(a+b) = 1 \cdot f(a) + 1 \cdot f(a)$$

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

(65.) If $f(x+y) = f(x) + f(y)$ and $a = b$
then show $f(b) + f(b) = f(2a)$

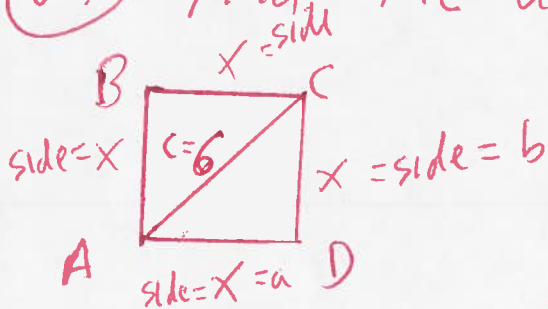
$$f(a+b) = f(a) + f(b)$$

$$f(a+a) = f(b) + f(b)$$

$$f(2a) = f(b) + f(b)$$

??

(66.) Find the area of the square.



$$a^2 + b^2 = c^2$$

$$(x)^2 + (x)^2 = (6)^2$$

$$x^2 + x^2 = 36$$

$$1x^2 + 1x^2 = 36$$

$$2x^2 = 36$$

$$\frac{2x^2}{2} = \frac{36}{2}$$

$$x^2 = 18$$

$$\sqrt{x^2} = \sqrt{18}$$

$$x = \sqrt{18}$$

$$A = L \cdot W$$

$$A = (\sqrt{18})(\sqrt{18})$$

$$A = (\sqrt{18})^2$$

$$A = 18$$

Area

(67) If $x \neq 0$, x is inversely proportional to y , then show $\frac{1}{x^2}$ is directly proportional to y^2 .

$$x = \frac{k}{y}$$

Constant k

$$(x)^2 = \left(\frac{k}{y}\right)^2$$

$$\frac{x^2}{1} = \frac{k^2}{y^2}$$

$$x^2 y^2 = 1(k^2)$$

$$x^2 y^2 = k^2$$

$$\frac{x^2 y^2}{x^2} = \frac{k^2}{x^2}$$

$$y^2 = \frac{k^2}{x^2}$$

(68) If $(x-8)(x-k) = x^2 - 5kx + m$ find m

$$x^2 - kx - 8x + 8k = x^2 - 5kx + m$$

$$\cancel{x^2} - kx - 8x + 8k - \cancel{x^2} = \cancel{x^2} - 5kx + m - \cancel{x^2}$$

$$-kx - 8x + 8k = -5kx + m$$

$$-kx - 8x = -5kx \quad \text{and} \quad 8k = m$$

$$x(-k-8) = x(-5k)$$

$$-k-8 = -5k$$

$$-k - 8 + 5k = -5k + 5k$$

$$4k - 8 = 0$$

$$4k - 8 + 8 = 0 + 8$$

$$4k = 8$$

$$\rightarrow \frac{4k}{4} = \frac{8}{4}$$

$$k = 2$$

subst

$$8k = m$$

$$8(2) = m$$

$$16 = m$$

(69) If $10^{ab} = 10000$ where a and b are positive integers then what are the possible values of a ?

$$10^{ab} = 10000$$

$$10^{ab} = 10^4$$

$$ab = 4$$

$$(1)(4) = 4 \quad \text{Possible}$$

$$(2)(2) = 4$$

$$(4)(1) = 4$$

$a \in \{1, 2, 4\}$ values possible

(70) If $2x - 3y = c$, $(x, y) = (8, -1)$ then find c .

$$2x - 3y = c$$

$$2(8) - 3(-1) = c$$

$$16 + 3 = c$$

$$19 = c$$

(71) If $5x = x + 5$ then find x

$$5x = x + 5$$

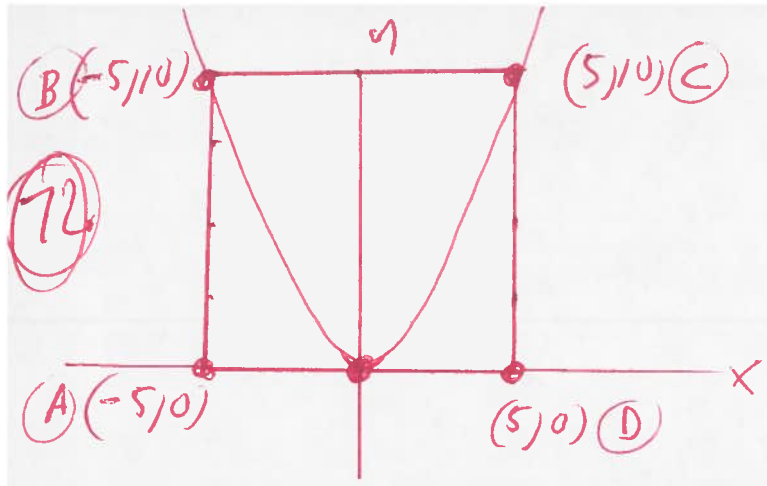
$$5x - x = x + 5 - x$$

$$4x = 5$$

$$\frac{4x}{4} = \frac{5}{4}$$

$$x = \frac{5}{4}$$

(69)



72

35

ABCD is a square with area of 100.
If $y = ax^2$ then find a .

$$y = ax^2$$

$$y = a(5)^2 = 10$$

$$y = a(25) = 10$$

$$y = 25a = 10$$

but $25a = 10$

$$\frac{25a}{25} = \frac{10}{25}$$

$$a = \frac{2}{5}$$

$a = \frac{2}{5}$

73. If $\frac{3}{4}x = 18$ then find $\frac{1}{4}x$.

$$\frac{3}{4}x = 18$$

$$\frac{4}{3} \left(\frac{3}{4}x \right) = \frac{4}{3}(18)$$

$$x = 4(6)$$

$x = 24$

$$\frac{1}{4}x =$$

$$\frac{1}{4}(24) =$$

$$1(6) =$$

$6 =$

74 If $f(x) = x(x-1)$ find $f(5)$

$$f(5) = 5(5-1)$$

$$f(5) = 5(4)$$

$$f(5) = 20$$

36

75 If $\sqrt{3} = x+1$ find $(x+1)^2$

$$\sqrt{3} = x+1$$

$$\sqrt{3} - 1 = x + x - 1$$

$$\sqrt{3} - 1 = x$$

$$(x+1)^2 =$$

$$((\sqrt{3} - 1) + 1)^2 =$$

$$(\sqrt{3})^2 =$$

$$3 =$$

76 If $|6-5y| > 20$ find y

$$|x| > a \\ x < -a \text{ OR } x > a$$

Let $6-5y < -20$ OR $6-5y > 20$

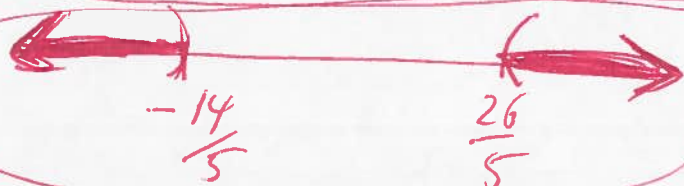
$$6-5y-6 < -20-6 \text{ OR } 6-5y-6 > 20-6$$

$$-5y < -26 \text{ OR } -5y > 14$$

$$\frac{-5y}{-5} > \frac{-26}{-5} \text{ OR } \frac{-5y}{-5} < \frac{14}{-5} \text{ Turn}$$

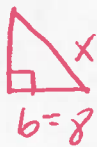
$$y > \frac{26}{5} \text{ OR}$$

$$y < -\frac{14}{5}$$



$$\left(-\infty, -\frac{14}{5}\right) \cup \left(\frac{26}{5}, \infty\right)$$

77) $a=6$, $b=8$ find the perimeter.



$$a^2 + b^2 = c^2$$
$$(6)^2 + (8)^2 = x^2$$

$$36 + 64 = x^2$$

$$100 = x^2$$

$$\sqrt{100} = \sqrt{x^2}$$

$$10 = x$$

Perimeter (all sides)

$$6 + 8 + 10 =$$

$$14 + 10 =$$

$$24 =$$

37

78) If $2x+5=3kx+5$ find k

$$2x+5-5=3kx+5-5$$

$$2x=3kx$$

$$(2)(x) = (3k)(x)$$

Divide

$$2 = 3k$$

$$\frac{2}{3} = \frac{3k}{3}$$

$$\frac{2}{3} = k$$

OR

$$2x = 3kx$$

$$2x - 3kx = 3kx - 3kx$$

$$2x - 3kx = 0$$

$$x(2 - 3k) = 0$$

$$x=0 \text{ OR } 2 - 3k = 0$$

$$2 - 3k - 2 = 0 - 2$$

$$-3k = -2$$

$$\frac{-3k}{-3} = \frac{-2}{-3}$$

$$k = \frac{2}{3}$$

$$k = \frac{2}{3}$$

(79) For the different integers the sum

$$N_1 + N_2 + N_3 + N_4 + N_5 + N_6 + N_7 + N_8 = 0 \text{ then}$$

what is the least number of integers that must be positive

38

Example

$$(-1) + (-2) + (-3) + (-4) + (-5) + (-6) + (-7) + N_8 = 0$$

$$-28 + N_8 = 0$$

$$-28 + N_8 + 28 = 0 + 28$$

$$N_8 = 28 \text{ positive}$$

one at least.

(80) graph $y_1 = x^2$ and $y_2 = 2x^2$

$y_1 = x^2$

x	y
-1	1
0	0
1	1

$y_2 = 2x^2$

x	y
-1	2
0	0
1	2

$y_1 = (-1)^2$
 $y_1 = (-1)(-1)$
 $y_1 = 1$

$y_2 = 2(-1)^2$
 $y_2 = 2(-1)(-1)$
 $y_2 = 2(1)$
 $y_2 = 2$

$y_1 = (0)^2$
 $y_1 = (0)(0)$
 $y_1 = 0$

$y_2 = 2(0)^2$
 $y_2 = 2(0)(0)$
 $y_2 = 2(0)$
 $y_2 = 0$

$y_1 = (1)^2$
 $y_1 = (1)(1)$
 $y_1 = 1$

$y_2 = 2(1)^2$
 $y_2 = 2(1)(1)$

$y = 2(1)$
 $y = 2$

