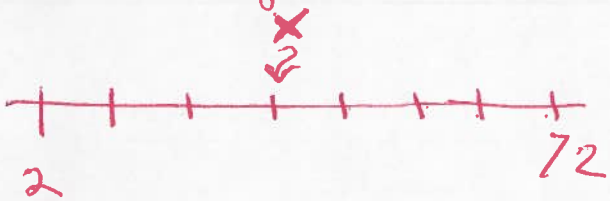
1

SAT 102415

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.
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 $(4,4)$.

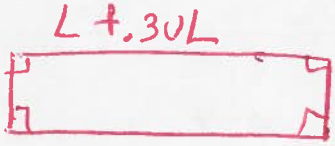
(21) If 

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.

(25) If 

find area.

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

(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 $8x$.

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

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

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

(50.) [redacted] $\frac{90}{15} = \frac{1}{x}$

(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.

t and k are positive integers.

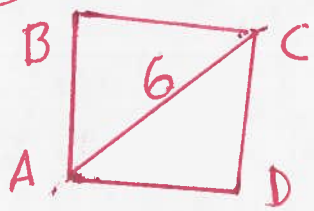
(62) Find $\frac{1}{2}$ of 29% of 618.

(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.

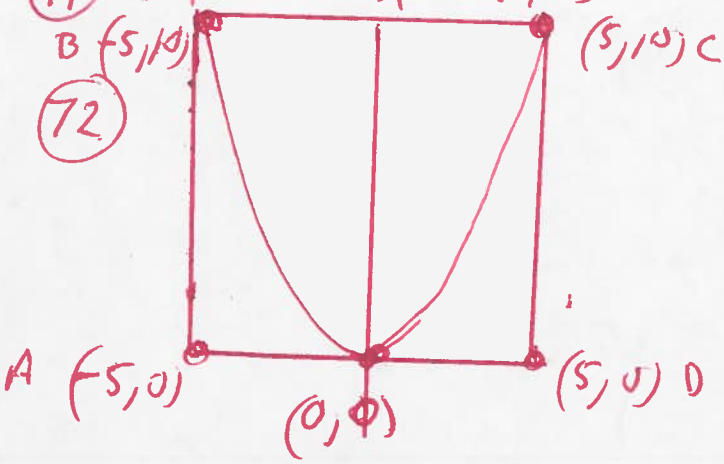
(68) If $(x-8)(x-k) = x^2 - 5kx + m$ find m

(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.

(72)



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

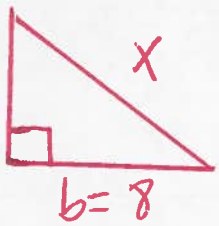
(73) $\frac{3}{4}x = 18$ then find $\frac{1}{4}x$.

(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 positive.

(80) graph $Y_1 = x^2$ and $Y_2 = 2x^2$

(1) If $x=4$ evaluate $(x+1)(x+2)$

(7)

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

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

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

$(5)(6) =$

$30 =$

(2) If $A=3B$, $C=2A$, $B=7$ then find C.

$A = 3B$

$A = 3(7)$

$A = 21$

$C = 2A$

$C = 2(21)$

$C = 42$

(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 $A \wedge B$.

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

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

$x_1 \; y_1 \qquad x_2 \; y_2$

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

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

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

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

$d = \sqrt{100+0}$

$d = \sqrt{100}$

$d = 10$

(6) If $3x^2=4y=24$ find x^2y.

$3x^2 = 24$

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

$x^2 = 8$

$4y = 24$

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

$y = 6$

$x^2y =$

$(8)(6) =$

$48 =$

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.

A

$r = 2$

$d = 2r$

$d = 2(2)$

$d = 4$

B

$r = 4$

$d = 2r$

$d = 2(4)$

$d = 8$

C

$r = 4$

$d = 2r$

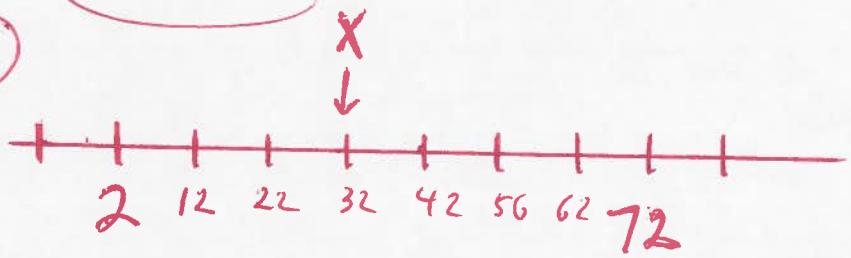
$d = 2(4)$

$d = 8$

$4 + 8 + 8 =$

$20 =$

8.



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

$\frac{70}{7} =$

$10 =$ 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.

$f(x)=ka^x$

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

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

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

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

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

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

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

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

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

$a=8$

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

(12) $x+y=19$ Find x and y.

$4x+5y=84$

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

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

$-5x-5y = -95$

$4x+5y = 84$

$-1x = -11$

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

$x = 11$

$x+y=19$

$(11)+y=19$

$11+y=19$

$11+y-11 = 19-11$

$y = 8$

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

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

$x+3y=12$

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

$3y = 12-x$

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

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

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

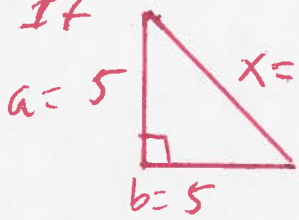
(14) Factor GCF

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

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

12

(15.) If



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

$2(m) = 5(12)$ cross mult

$2m = 60$

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

$m = 30$

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

$|X| = a$

$X = -a$ OR $X = a$

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

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

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

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

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

$x = \frac{11}{4}$ OR $x = \frac{13}{4}$

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

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

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

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

$a - 1.2 + 2.0 = 0$ OR $a - 1.2 - 2.0 = 0$

$a + .8 = 0$ OR $a - 3.2 = 0$

$a + .8 - .8 = 0 - .8$ OR $a - 3.2 + 3.2 = 0 + 3.2$

$a = -.8$ OR $a = 3.2$

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

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

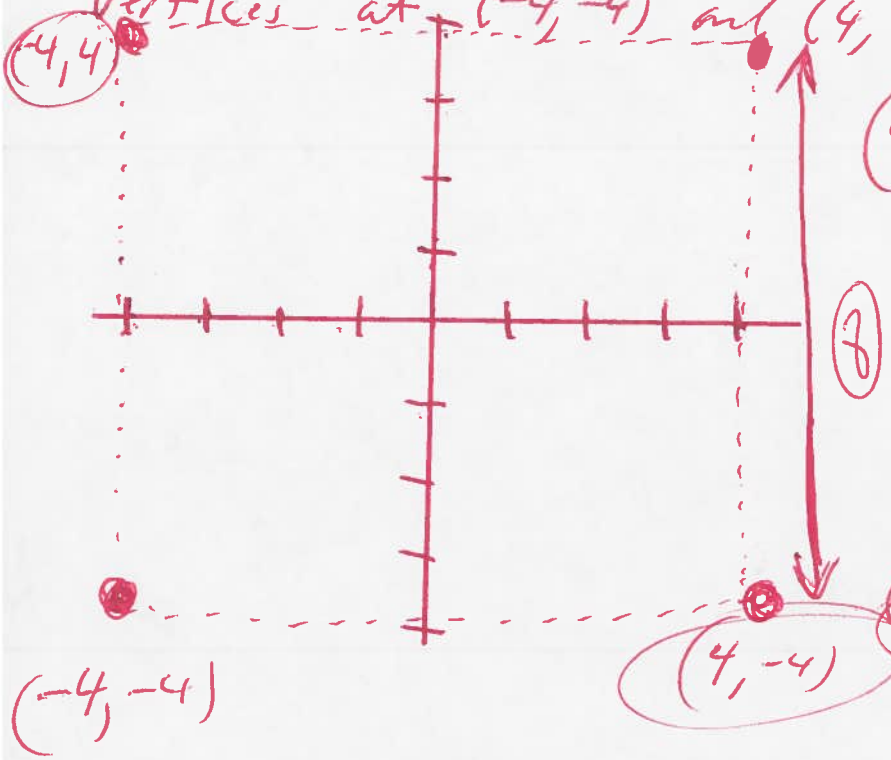
$f(5,2,3) = (5)(5) - (5)(3) + 3$

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

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

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

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



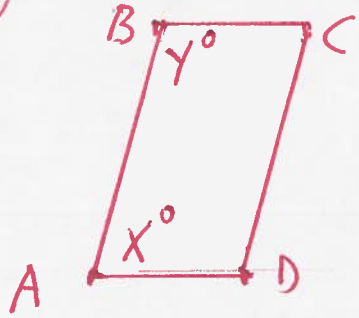
length = 8 width = 8

$A = L \cdot W$

$A = (8)(8)$

$A = 64$

(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

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

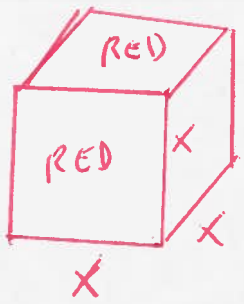
$3(k) = 3\left(\frac{x}{3}\right)$

$3k = x$

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

$27k = 9x$

(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.



each face area = $L \cdot W = (x)(x) = x^2$ (10)

$4x^2 = 64$

$\frac{4x^2}{4} = \frac{64}{4}$

$x^2 = 16$

$\sqrt{x^2} = \sqrt{16}$

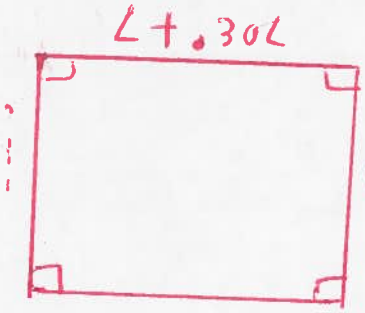
$x = 4$ length

$V = L \cdot W \cdot H$

$V = (4)(4)(4)$

$V = 64$

(25.)



Find area.

$A = LW$

$A = (L + .30L)(W - .30W)$

$A = (1.00L + .30L)(1.00W - .30W)$

$A = (1.30L)(.70W)$

$A = .91LW$

1.30
.70
000
910
.91 00

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

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

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

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

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

$f(10) = -150 + k$

(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?

$(5)(4) =$ (inside) * (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 $8x$.

$2x+3=10$

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

$2x=7$

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

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

$8x=$

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

$4(7)=$

28

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

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

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

$x-2=\pm 6$

$x-2=-6$ OR $x-2=6$

$x-2+2=-6+2$ OR $x-2+2=6+2$

$x=-4$ OR $x=8$

(33) If $m = \epsilon^8$, $w = m^2 + m$, find w in terms of ϵ.

$w = m^2 + m$

$w = (\epsilon^8)^2 + (\epsilon^8)$

$w = \epsilon^{16} + \epsilon^8$

(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

$\frac{x}{y} =$

$\frac{6}{4} =$

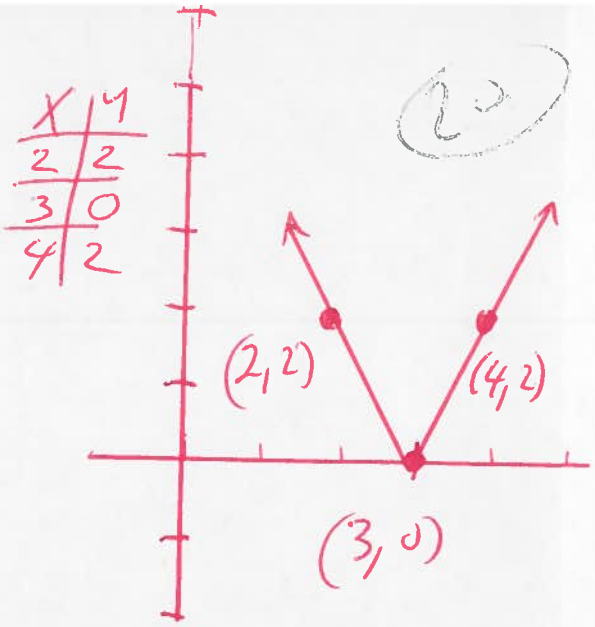
$\frac{2(3)}{2(2)} =$

$\frac{3}{2} =$

not an integer

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

x	y
2	2
3	0
4	2



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

$y = |-4+6|$

$y = |2|$

$y = 2$

$y = |-2(3)+6|$

$y = |-6+6|$

$y = |0|$

$y = 0$

$y = |-2(4)+6|$

$y = |-8+6|$

$y = |-2|$

$y = 2$

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

$x = 1+2y$ subst

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

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

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

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

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

$1+4y = 0$

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

$4y = -1$

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

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

Subst

$x = 1+2y$

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

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

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

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

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

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

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

(38) If $V = LWH$, $L = d$, $W = d$, $H = k$

find V in terms of d and k

$V = LWH$

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

$V = d^2k$

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

x_1 y_1 m

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

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

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

$y - 1 = -2x + 4$

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

$y = -2x + 5$

(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

$11+X+X^2=$

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

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

$11+0+0=$

$11=$

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

$7(x)=16(3.5)$

$7x=56$

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

$x=8$

$$\begin{array}{r} {}^{1}3 \\ 16 \\ \times\ 3.5 \\ \hline 180 \\ 48 \\ \hline 56.0 \end{array}$$

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

$k+n-k<k-k$

$n<0$

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

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

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

$\frac{32}{1}=$

$32=$

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

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

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

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

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

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

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

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

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

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

(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

(25)

$90(x) = 15(1)$

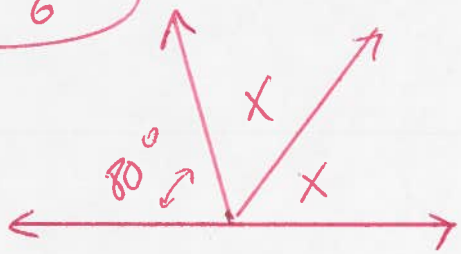
$90x = 15$

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

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

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

(51)



Find X

$80 + x + x = 180$

$80 + 2x = 180$

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

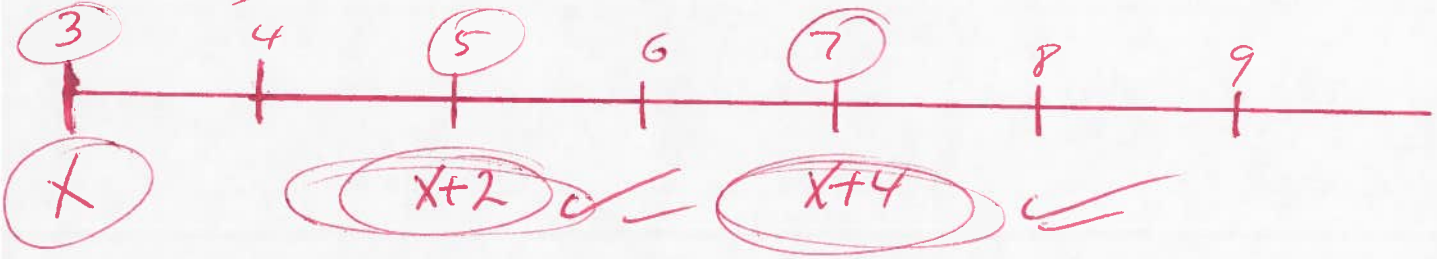
$2x = 100$

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

$x = 50$

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

Example →



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

2C.

$(x+y)^2=100$

$(x-y)^2=16$

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

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

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

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

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

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

$(x^2+2xy+y^2)(1)=100(1)$ Mult

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

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

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

$4xy=84$

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

$xy=21$

$4\overline{)84}$ → 21

$-(8)$

4

$-(4)$

0

Subst

$2(xy)=2(21)$

$2xy=42$

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

$-1 \leq 4x-5$

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

$4 \leq 4x$

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

$1 \leq x$

OR $x \geq 1$

$[1, \infty)$

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

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

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

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

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

$2^n(3) = k$

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

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

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

(28)

$20y - 5y = 150$

$15y = 150$

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

$y = 10$

$y = x - 5$

$10 = x - 5$

$10 + 5 = x - 5 + 5$

$15 = x$

(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.

$$\frac{\text{yellow}}{\text{blue} + \text{red} + \text{yellow}} =$$

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

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

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

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

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

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

$P(16)=3000(16)$

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

16

$\times 3000$

$48\,000$

(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.

t and k are positive integers

possible

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

$(3,1)$ $(3,2)$ ↓

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

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

$t > k$ ✓

$3 > 2$

$t = 3$

$t^2 - k^2 < 6$

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

$9 - 4 < 6$

$5 < 6$ ✓

$t+k > 4$

$3+2 > 4$

$5 > 4$ ✓

$t = 3$

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

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

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

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

$(.29)(309) =$

89.61

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

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

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

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

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

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

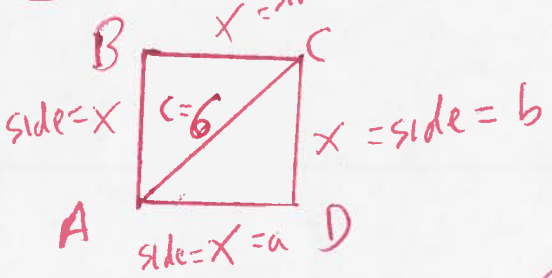
(65.) If $f(x+y) = f(x) + f(y)$ and $a = b$ then show $f(b) + f(b) = f(2a)$

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

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

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

(66.) Find the area of the square.



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

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

$x^2 + x^2 = 36$

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

$2x^2 = 36$

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

$x^2 = 18$

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

$x = \sqrt{18}$

$A = L \cdot W$ (Area)

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

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

$A = 18$

(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

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

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

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

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

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

$-k - 8 = -5k$

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

$4k - 8 = 0$

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

$4k = 8$

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

$k = 2$ 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?

(4)

$10^{ab} = 10000$

$10^{ab} = 10^4$

$ab = 4$

$(1)(4) = 4$ 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.

$x \quad y$

$2x - 3y = C$

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

$16 + 3 = C$

$19 = C$

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

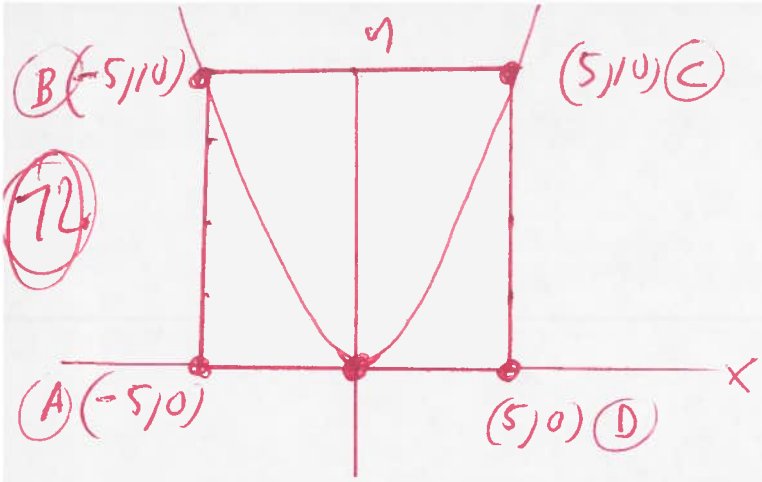
$5x = x + 5$

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

$4x = 5$

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

$x = 5/4$



72

25

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

$y = ax^2$

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

$y = a(25) = 10$

$y = 25a = 10$

Let $25a = 10$

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

$a = \frac{f(2)}{f(5)}$

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

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 $f(5)$

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

$f(5) = 5(4)$

$f(5) = 20$

(76)

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

$\sqrt{3} = x+1$

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

$\sqrt{3} - 1 = x$

$(x+1)^2 =$

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

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

$3 =$

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

$|x| > a$
$x < -a$ OR $x > a$

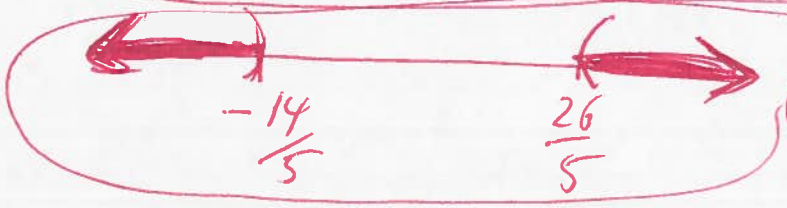
$6-5y < -20$ OR $6-5y > 20$

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

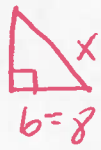
$-5y < -26$ OR $-5y > 14$

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

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



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

(77) 

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)

$6+8+10=$

$14+10=$

$24=$

(77)

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

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

$2x=3kx$

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

Let $2=3k$

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

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

OR

$2x=3kx$

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

$2x-3kx=0$

$x(2-3k)=0$

$x=0$ OR $2-3k=0$

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

$-3k=-2$

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

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

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

(58)

Example

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

$-28+N_8=0$

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

$N_8=28$ positive one at least.

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

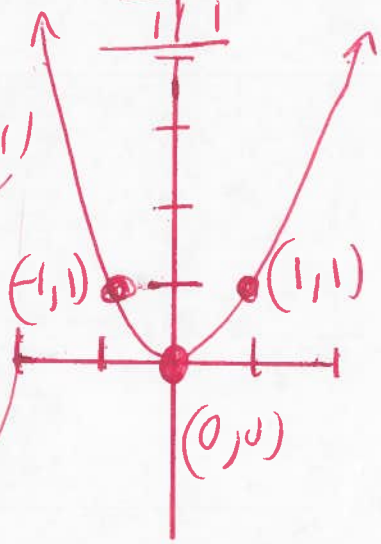
$y_1=x^2$

x	y
-1	1
0	0
1	1

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

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

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



$y_2=2x^2$

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

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

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

x	y
-1	2
0	0
1	2