SAT # 8

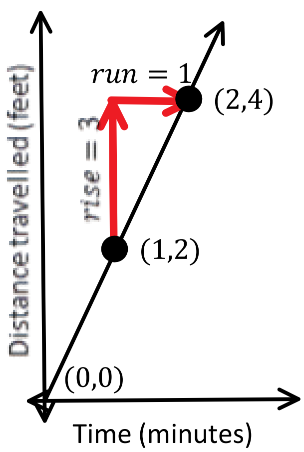
SAT # 8 - 1,2,3

Combine Like Terms
Algebra

$$3x + x + x + x - 3 - 2 = 7 + x + x$$
$$6x - 5 = 7 + 2x$$
$$+5 \quad +5$$
$$6x = 12 + 2x$$
$$-2x \quad -2x$$
$$4x = 12$$
$$\frac{4x}{4} = \frac{12}{4}$$
$$x = 3$$

Substitute with Brackets

$$3x + x + x + x - 3 - 2 = 7 + x + x$$
$$3(3) + (3) + (3) + (3) - 3 - 2 = 7 + (3) + (3)$$
$$13 = 13$$



$y = mx + b$

$d = 2x + 0$

$m : slope = \frac{rise}{run}$

$b : y - intercept$

$y - int = (0,0)$

(x_2, y_2) $(1,2)$ $\quad$ (x_1, y_1) $(0,0)$

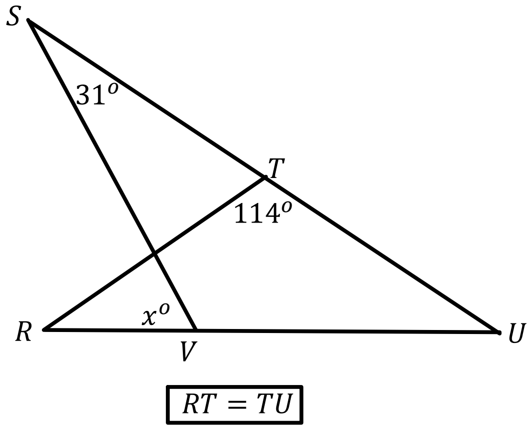
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$m = \frac{(2) - (0)}{(1) - (0)}$$
$$m = \frac{2}{1} = \frac{rise}{run}$$

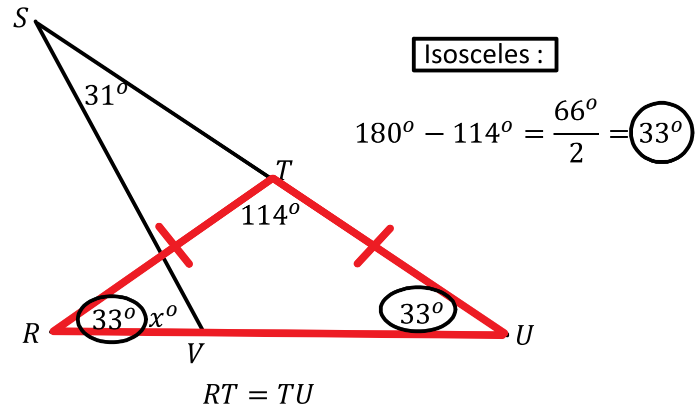
x	y
0	0
1	2
2	4

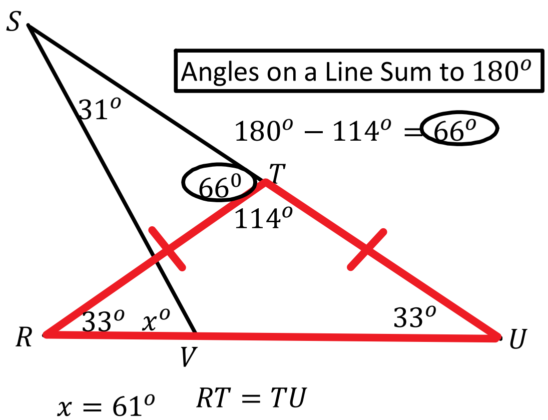
$$E = \frac{O + 4M + P}{6}$$
$$6 \times E = \frac{O + 4M + P}{6} \times 6$$
$$6E = O + 4M + P$$
$$-O \quad -O$$
$$6E - O = 4M + P$$
$$-4M \quad -4M$$
$$6E - O - 4M = P$$
$$P = 6E - O - 4M$$

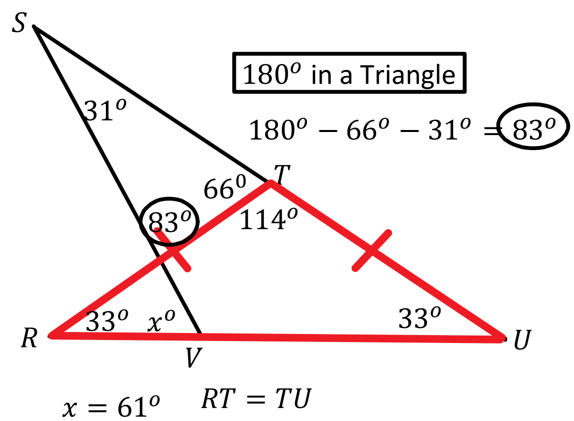
Algebra

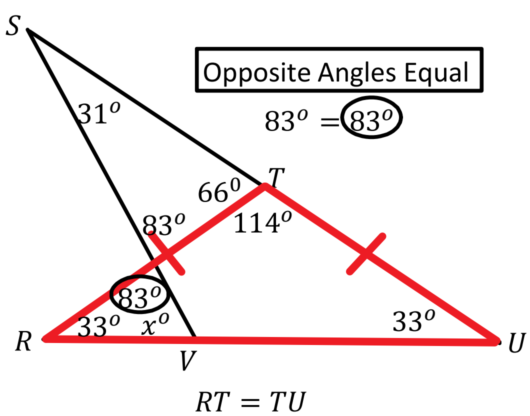
SAT # 8 - 4

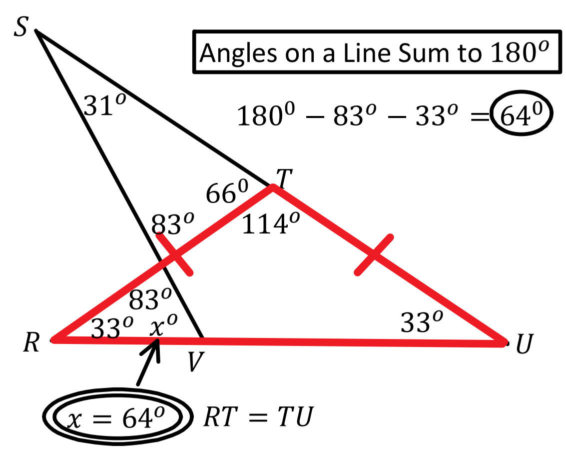

S
31°
T
114°
x°
R
V
U
RT = TU


Isosceles :
180° − 114° = 66°/2 = 33°
S
31°
T
114°
33°
x°
33°
R
V
U
RT = TU


Angles on a Line Sum to 180°
180° − 114° = 66°
S
31°
66°
T
114°
33°
x°
33°
R
V
U
x = 61°
RT = TU

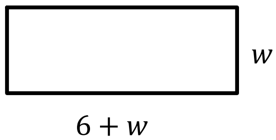

180° in a Triangle
180° − 66° − 31° = 83°
S
31°
66°
T
83°
114°
33°
x°
33°
R
V
U
x = 61°
RT = TU


Opposite Angles Equal
83° = 83°
S
31°
66°
T
83°
114°
83°
33°
x°
33°
R
V
U
RT = TU


Angles on a Line Sum to 180°
180° − 83° − 33° = 64°
S
31°
66°
T
83°
114°
83°
33°
x°
33°
R
V
U
x = 64°
RT = TU

SAT # 8 - 5,6

$let\ w = width$



$p = w + w + (6 + w) + (6 + w)$

$p = 4w + 12$

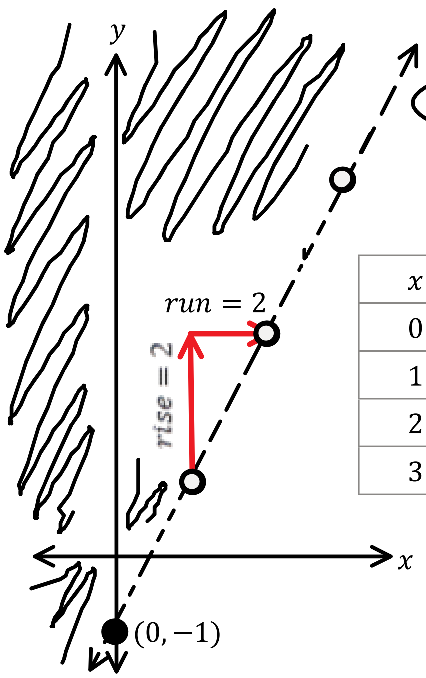
$y = mx + b$ $\quad m : slope = \frac{riss}{run}$

$b : y - intercept$

$y > 2x - 1$

$y - int = -1$

$m = \frac{2}{1} = \frac{rise}{run}$



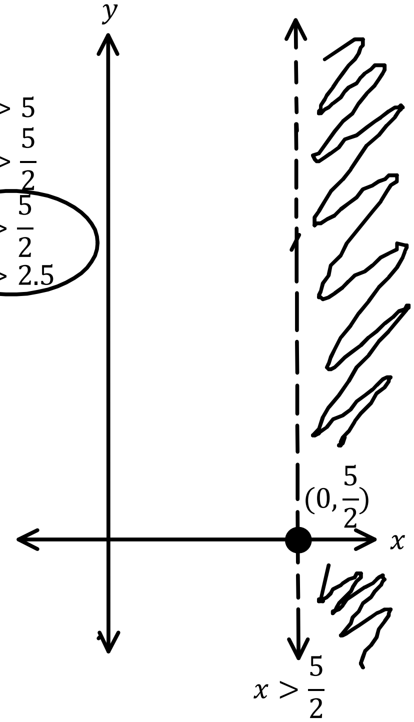
x	y
0	−1
1	1
2	3
3	5

$2x > 5$

$\frac{2x}{2} > \frac{5}{2}$

$x > \frac{5}{2}$

$x > 2.5$



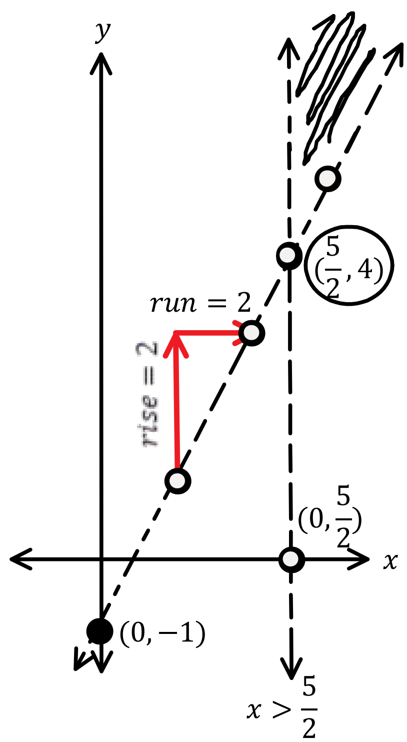
$y = 2(x) - 1$ $\quad x = \frac{5}{2}$

$y = 2\left(\frac{5}{2}\right) - 1$

$y = 5 - 1$

$y = 4$ $\quad (\frac{5}{2}, 4)$

Isolate
Substitute
Solve



$y > 4$

SAT # 8 - 7/8

$\sqrt{2x+6}+4=x+3$

$-4 \quad -4$

$\sqrt{2x+6}=x-1$

$\left(\sqrt{2x+6}\right)^2=(x-1)^2$

$2x+6=(x-1)(x-1)$

$2x+6=x^2-1x-1x+1$

$2x+6=x^2-2x+1$

$-6 \quad -6$

$2x=x^2-2x-5$

$-2x \quad -2x$

$0=x^2-4x-5$ $\boxed{Get=0}$

$0=(x-5)(x+1)$ Factor

$\boxed{(a)(b)=0 \quad a=0 \quad b=0}$

$x-5=0$ $\quad$ $x+1=0$

$+5 \quad +5$ $\quad$ $-1 \quad -1$

$x=5$ $\quad$ $x=-1$

$\sqrt{2x+6}+4=x+3$

$\sqrt{2(5)+6}+4=(5)+3$

$\sqrt{10+6}+4=(5)+3$

$\sqrt{16}+4=8$

$4+4=8$

$8=8$

$LHS=RHS$

$\sqrt{2x+6}+4=x+3$

$\sqrt{2(-1)+6}+4=(-1)+3$

$\sqrt{-2+6}+4=(-1)+3$

$\sqrt{4}+4=2$

$2+4=2$

$6\neq 2$

$LHS\neq RHS$

$\frac{f(x)}{g(x)}=\frac{x^3-9x}{x^2-2x-3}$

$f(x)=x^3-9x$

$f(x)=x(x^2-9)$

$f(x)=x(x+3)(x-3)$

$f(x)=x^2-2x-3$

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

$\frac{f(x)}{g(x)}=\frac{x(x+3)(x-3)}{(x+1)(x-3)}$

$\frac{f(x)}{g(x)}=\frac{x(x+3)\cancel{(x-3)}}{(x+1)\cancel{(x-3)}}$

$x+1\neq 0$ $\quad$ $x-3\neq 0$ $\quad$ $\boxed{\text{Denominator}\neq 0}$

$x\neq -1$ $\quad$ $x\neq 3$

$\frac{f(x)}{g(x)}=\frac{x(x+3)}{(x+1)}$ $\quad$ $x\neq -1,3$

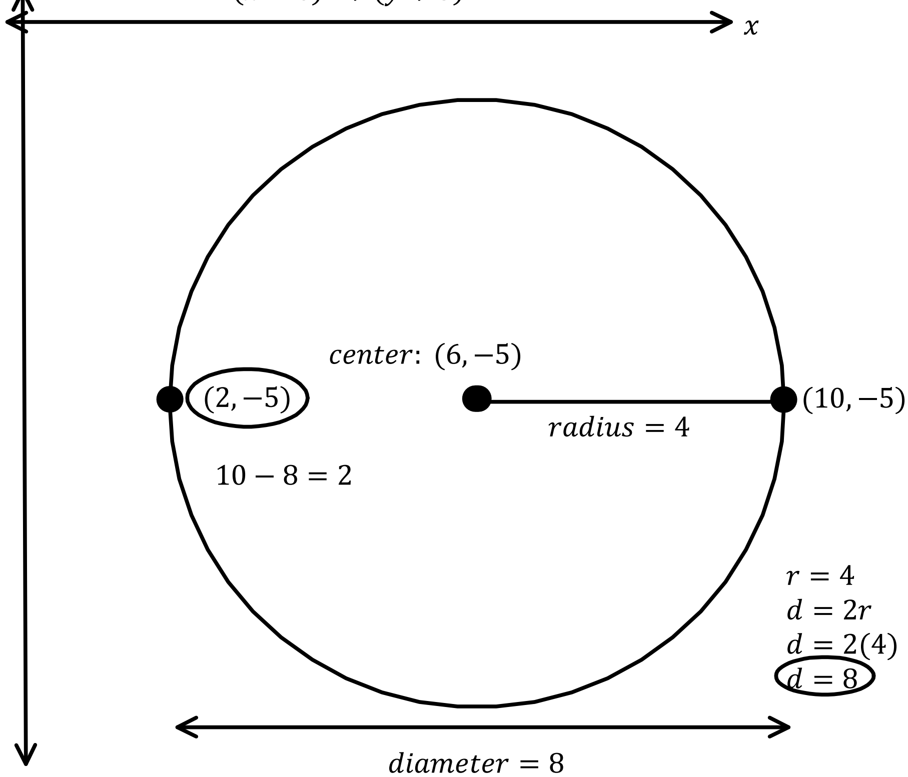
Set Denominator $\neq 0$ *and solve*

SAT # 8 - 9,10

$\boxed{(x-h)^2 + (y-k)^2 = r^2}$ $Center: (h, k)$ $Radius = 2$

$(x-6)^2 + (y+5) = 16$

$(x-6)^2 + (y+5) = 4^2$



$202\ people$

$60\ tents$ (2/4person)

$let\ t = \#\ 2\ person\ tents$

$let\ f = \#\ 4\ person\ tents$

$\boxed{let\ x = what\ you\ dont\ know!}$

$$2t + 4f = 202$$
$$\frac{2t}{2} + \frac{4f}{2} = \frac{202}{1}$$
$$t + 2(f) = 101$$

$$t + f = 60$$
$$-t \qquad -t$$
$$f = (60 - t)$$

$$t + 2(60 - t) = 101$$
$$t + 120 - 2t = 101$$
$$-t + 404 = 101$$
$$-120 \quad -120$$
$$-t = -19$$
$$\frac{-t}{-1} = -\frac{19}{-1}$$
$$t = 19$$

$$f = (60 - (19))$$
$$f = 41$$

$19 + 41 = 60$

Elimination

$t + 2f = 101$	$t + f = 60$
$-(t + f = 60)$	$t + (41) = 60$
$f = 41$	$-41 \quad -41$
	$t = 19$

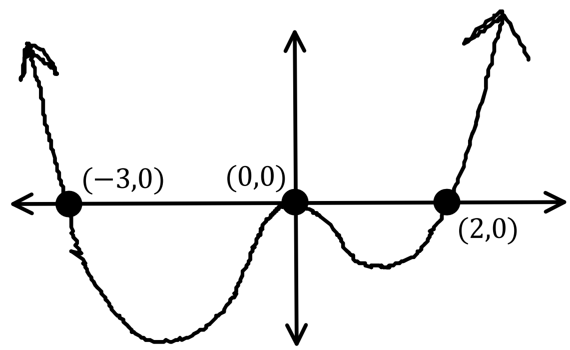
$2(19) + 4(41) = 38 + 164 = 202$

$19\ two\ person\ tents$

$41\ four\ person\ tents$

Words Problems	
Diagram	Solve (Algebra)
Let Statements	Substitute
Equation/s	Solve
(Arbitrary#'s)	Answer in English!
Isolate	Check Answer!
Substitute/(Eliminate*)	Explain it to a 10 year old!

SAT # 8 - 11,12,13



$x = -3$ | $x = 0$ | $x = 2$
$+3 \quad +3$ | | $-2 \quad -2$
$x + 3 = 0$ | | $x - 2 = 0$

$y = a(x - \#)^{\#}(x - \#)^{\#} \ldots$

$y = a(x + 3)^1(x)^2(x - 2)^1$

$y = x^2(x + 3)(x - 2)$

$4\ million, 2000$ $\quad (x_1, y_1) \quad (x_2, y_2)$

$1.9\ milliin, 2013$ $\quad (0,4) \quad (13,1.9)$

$let\ t = time\ (after\ year\ 2000)$

$let\ b = \#\ oil\ \&\ gas\ barrels$

$b = f(t)$

Time is always x $(independent)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$m = \frac{(1.9) - (4)}{(13) - (0)}$$
$$m = \frac{-2.1}{-13}$$
$$m = \frac{2.1}{13} \times \frac{10}{10}$$
$$m = \frac{21}{130}$$

$$y = mx + b$$
$$y = \frac{21}{130}x + b$$
$$(4) = \frac{21}{130}(0) + b$$
$$4 = 0 + b$$
$$b = 4$$

$(0,4)$

$$y = \frac{21}{100}x + 4$$
$$f(t) = \frac{21}{100}x + 4$$

$$\frac{2a}{b} = \frac{1}{2}$$
$$2 \times 2a = 1 \times b$$
$$4a = b$$
$$\frac{4a}{a} = \frac{b}{a}$$
$$\frac{b}{a} = 4$$

OR

$$\frac{2a}{b} = \frac{1}{2}$$
$$\underline{\quad} = \underline{\quad}$$
$$2 \times 2 = \frac{b}{a}$$
$$\frac{b}{a} = 4$$

SAT # 8 - 14

$y = x^2 + 3x - 7$

$y - 5x + 8 = 0$
$+5x \quad + 5x$
$y - 8 = 5x$
$+8 \quad +8$
$y = (5x + 8)$

$y = (5x + 8)^2 + 3(5x + 8) - 7$

$(5x + 8)^2$
$(5x + 8)(5x + 8)$
$25x^2 + 40x + 40x + 64$
$25x^2 + 80x + 64$

$y = (25x^2 + 80x + 64) + 15x + 24 - 7$

$y = 25x^2 + 95x + 57$

$a \quad b \quad c$

$a = 25$
$b = 95$
$c = 57$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Quadratic Equation

$Discriminant = b^2 - 4ac$

$b^2 - 4ac$
$(95)^2 - 4(25)(57)$
$9025 - 5700$
$3325 > 0$

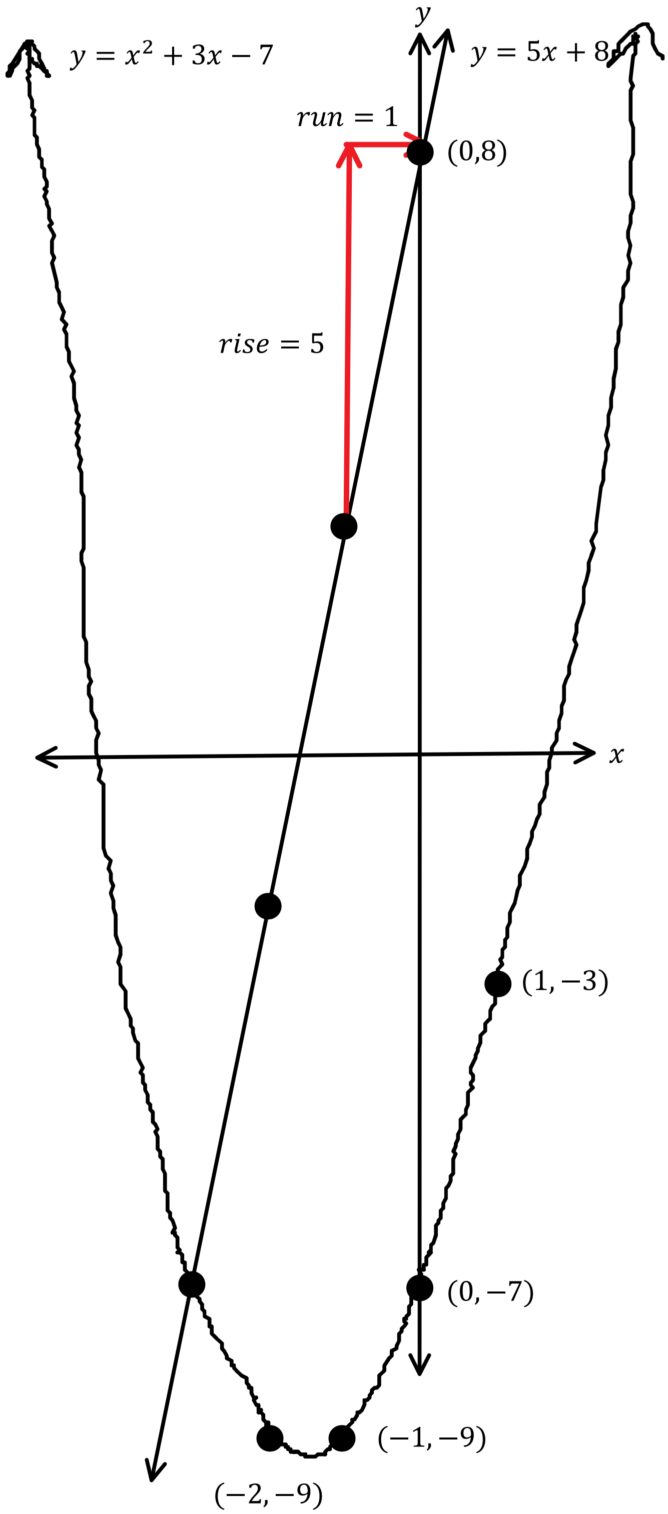
$95^2 \gg 4(25)(57)$

$\gg$: *So much greater*

$b^2 - 4ac > 0$ — *2 solutions*

$3325 > 0$

SAT # 8 - 14 Cont



$2\ solutions$

x	y
-1	-1
0	-7
1	-3
-2	-9

$y = x^2 + 3x - 7$
$y = (-1)^2 + 3(-1) - 7$
$y = 1 - 3 - 7$
$y = -9$

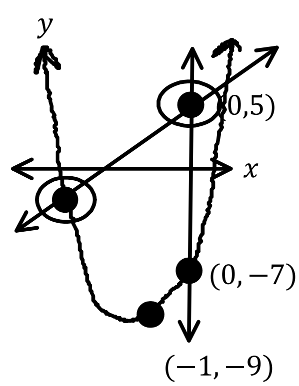
$y = x^2 + 3x - 7$
$y = (0)^2 + 3(0) - 7$
$y = 0 - 0 - 7$
$y = -7$

$y = x^2 + 3x - 7$
$y = (1)^2 + 3(1) - 7$
$y = 1 + 3 - 7$
$y = -3$

$y = x^2 + 3x - 7$
$y = (-2)^2 + 3(-2) - 7$
$y = 4 - 6 - 7$
$y = -9$

$y = x^2 + 3x - 7$ $\quad$ *Opens Up*

x	y
-1	-9
0	-7



$2\ solutions$

SAT # 8 - 15,16,17,18

$g(x) = 2x - 1$ $\quad h(x) = 1 - g(x)$

$g(0) = 2(0) - 1$
$g(0) = 0 - 1$
$g(0) = -1$

$h(0) = 1 - g(0)$
$h(0) = 1 - (-1)$
$h(0) = 1 + 1$
$h(0) = 2$

$x^2 + x - 12 = 0$
$(x + 4)(x - 3) = 0$

$x + 4 = 0$ $\quad x - 3 = 0$
$x = -4$ $\quad x = 3$

$a = 3$

$(-2x^2 + x + 31) + (3x^2 + 7x + 8) = ax^2 + bx + c$ $\quad sum = +$
$1x^2 + 8x + 39$

a $\quad b$ $\quad c$

$a = 1$
$b = 8$
$c = 39$

$-x + y = -3.5$
$+x \quad\quad +x$
$y = (x - 3.5)$

$y = (5) - 3.5$
$y = 1.5$

$x + 3(y) = 9.5$
$x + 3(x - 3.5) = 9.5$
$x + 3x - 10.5 = 9.5$
$4x - 10.5 = 9.5$
$+10.5 \quad +10.5$
$4x = 20$
$\frac{4x}{4} = \frac{20}{4}$
$x = 5$

$(5,1.5)$

$3.5 = 3\frac{1}{2} = \frac{2 \times 3 + 1}{2} = \frac{7}{2}$

$5 - \frac{7}{2}$
$5 \times \frac{2}{2} - \frac{7}{2}$
$\frac{10}{2} - \frac{7}{2}$
$\frac{10 - 7}{2}$
$\frac{3}{2} = 1.5$

$-x + y = -3.5$
$+ \ (x + 3y = 9.5)$
$4y = 6$
$\frac{4y}{4} = \frac{6}{4}$
$y = \frac{3}{2}$
$y = 1.5$

$x + 3(y) = 9.5$

$x + 3(1.5) = 9.5$
$x + 4.5 = 9.5$
$-4.5 \quad -4.5$
$x = 5$

SAT # 8 - 19,20

$8\ employees, Start$

$let\ e = \#\ of\ employees$
$let\ m = months$

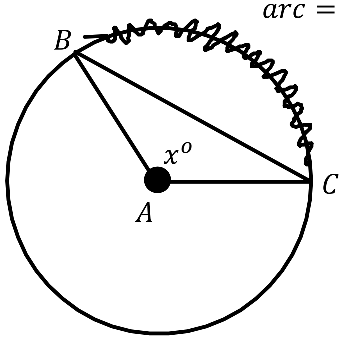
m	e
0	8
3	10
6	12

(x_1, y_1) $(0,8)$ (x_2, y_2) $(3,10)$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$m = \frac{10 - 8}{3 - 0}$$
$$m = \frac{2}{3}$$

$$y = mx + b$$
$$y = \frac{2}{3}x + b$$
$$(10) = \frac{2}{3}(3) + b \quad (3,10)$$
$$10 = 2 + b$$
$$-2 \quad -2$$
$$8 = b$$

$$arc = \frac{2}{5}C$$



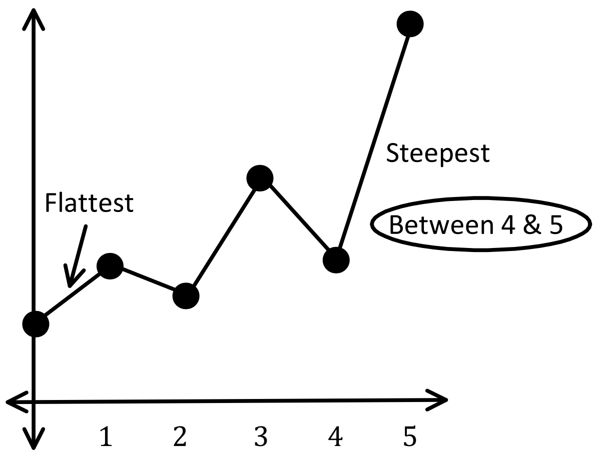
$$\frac{\theta}{360^o} = \frac{arc}{C}$$
$$\frac{x}{360^o} = \frac{2}{5}$$
$$360 \times \frac{x}{360^o} = \frac{2}{5} \times 360$$
$$x = 2 \times 72$$
$$x = 144^o$$

SAT # 8 - 1,2,3,4,5,6,7

$1\ lb\ grapes = \$2$ $\boxed{lb = pound}$

let $c^* = lbs\ of\ grapes$
let $C = Cost$

$C = 2c$



$200\ cars\ - 3\ defects$

let $x = \#\ defects\ in\ 10000\ cars$

$\boxed{Over = Over \quad \frac{\square}{\square} = \frac{\square}{\square}}$

$\times 50$

$$\frac{3}{200} = \frac{x}{10000}$$

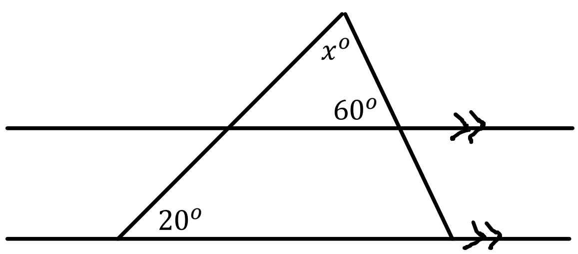
$\times 50$

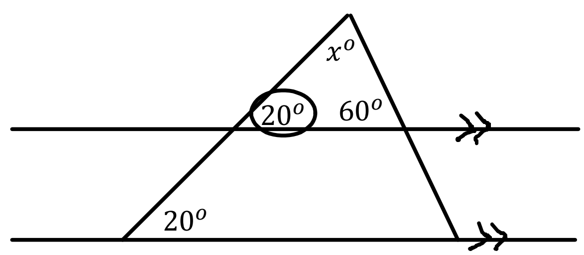
$$\frac{10000}{200} = 50$$

$3 \times 50 = 150$

$x = 150$

$y = 1.67x + 21.1$
$y = 1.67(19) + 21.1$
$y = 52.83$





Corresponding Angles Equal.

180^o in a triangle

$180^o - 20^o - 60^o = 100^o$ $\quad x = 100^o$

$Bench\ tickets = \$75$
$Lawn\ tickets = \$40$

$350\ Tickets\ sold$
$Revenue = \$19{,}250$

$\boxed{Revenue = Price \times Quantity}$

let $b = \#\ of\ Bench\ tickets$
let $l = \#\ of\ Lawn\ tickets$

$75b + 40l = 19250$ $\quad b + l = 350$ $\quad \boxed{ax + by = c}$

$y = mx + b$ $\quad m = slope = 3$

$y = 3x + 2$

SAT # 8 - 8

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

$$(x+1)\times(x+1)=\frac{2}{\cancel{x+1}}\times\cancel{(x+1)}$$

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

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

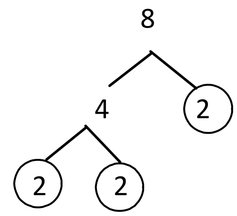
$$-2 \quad -2$$

$$1x^2+2x-1=0$$

$a \quad b \quad c$

$a=1$
$b=2$
$c=-1$

$$\boxed{x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}}$$ **Quadratic Equation**



$$x=\frac{-(2)\pm\sqrt{(2)^2-4(1)(-1)}}{2(1)}$$

$$x=\frac{-2\pm\sqrt{4+4}}{2}$$

$$x=\frac{-2\pm\sqrt{8}}{2}$$

$$x=\frac{-2\pm2\sqrt{2}}{2}$$

$\sqrt{8}=\sqrt{2\times2\times2}$
$\sqrt{8}=2\sqrt{2}$

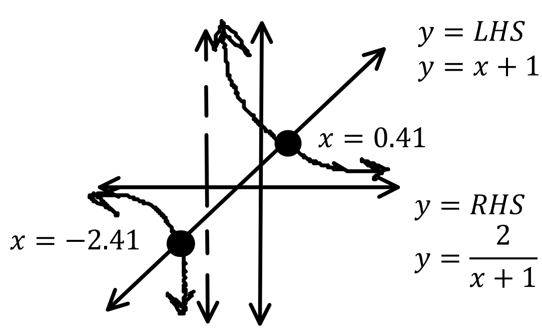
$$x=\frac{-2\pm2\sqrt{2}}{2} \quad \boxed{\frac{\div 2}{\div 2}}$$

$$x=-1\pm\sqrt{2}$$

$x=-1+\sqrt{2}$ $\quad$ $x=-1-\sqrt{2}$

$x=0.41$ $\quad$ $x=-2.41$

$a)\ 1-\sqrt{2}=-0.414$
$b)\ \sqrt{2}=1.41$
$c)\ 2$
$d)\ 4$



Substitution

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

$$(4)+1=\frac{2}{(4)+1} \qquad (2)+1=\frac{2}{(2)+1}$$

$$5\neq\frac{2}{5} \qquad 3\neq\frac{2}{3}$$

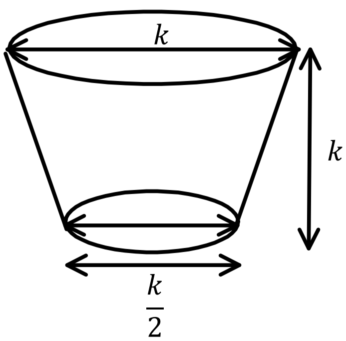
$$x+1=\frac{2}{x+1} \qquad x+1=\frac{2}{x+1}$$

$$(1.41)+1=\frac{2}{(1.41)+1} \qquad (-0.414)+1=\frac{2}{(-0.414)+1}$$

$$2.41\neq\frac{2}{3.41} \qquad 0.5858\neq\frac{2}{0.5858}$$

SAT # 8 - 9,10,11

Frustrum



$V_{max} = 473\ cm^3 = 16\ oz$ $\boxed{ouce = oz}$

$$\boxed{V = \frac{7\pi k^3}{48}}$$

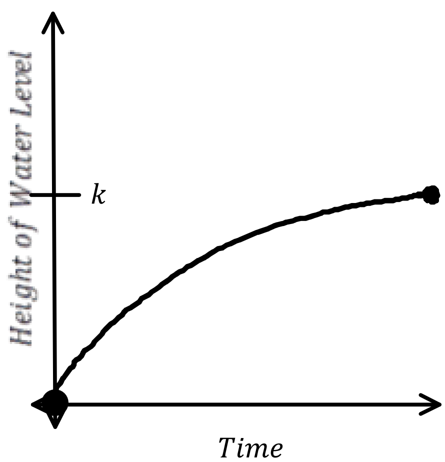
$$473 = \frac{7\pi k^3}{48}$$

$$\_\_\_\_ = \_\_\_\_$$

$$\frac{473}{7\pi} = k^3$$

$$\sqrt[3]{\frac{473}{(7\pi)}} = \sqrt[3]{k^3}$$

$$k = 4.22\ cm$$



Height rises quicker in the beginning, then slows down.

$1\ gallon\ jug$ $\boxed{1\ gallon\ jug = 128\ fluid\ ounces}$

$$\boxed{Over = Over \quad \frac{\square}{\square} = \frac{\square}{\square}}$$

$$128\ \text{~~fluid ounces~~} \times \frac{1\ gallon}{16\ \text{~~fluid ounces~~}}$$

$$128 \times \frac{1\ gallon}{16} = 8\ gallons$$

OR

$$\div 8$$

$$\frac{1}{128} = \frac{x}{16}$$

$$\div 8$$

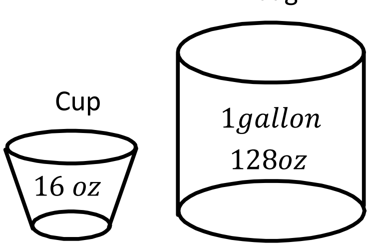
$x = 8$

$1 \times 8 = 8$

OR

Cup

Jug



$$\frac{128}{16} = 8$$

SAT # 8 - 12,13,14,15

$\$50,000\ policy$
$\$100,000\ policy$

$let\ x = \#\ of\ \ \$50,000\ policies$
$let\ y = \#\ of\ \$100,000\ policies$

$x + y > 57$ $\quad 50,000x + 100,000y > 3,000,000$ $\quad ax + by = c$

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

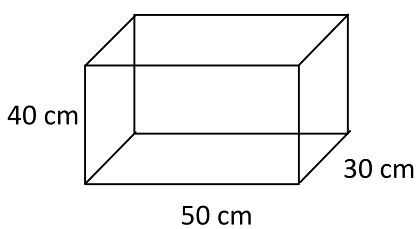
$$\left(a^{-\frac{1}{2}}\right)^{+\frac{2}{1}} = (x)^{+\frac{2}{1}} \qquad -\frac{1}{2} \times \frac{2}{1} = 1$$

$$a = x^2$$

$$\frac{-3}{x^2 + 3x - 10}$$

$$x^2 + 3x - 10 \neq 0$$
$$(x+5)(x-2) \neq 0$$

$$x + 5 \neq 0 \qquad x - 2 \neq 0$$
$$x \neq -5 \qquad x \neq +2$$



$$d = 2.8\frac{g}{cm^3}$$

$$v = lwh$$
$$v = 30 \times 50 \times 40$$
$$v = 60,000\ cm^3$$

$$2.8\frac{g}{\cancel{cm^3}} \times 60,000\ \cancel{cm^3} = 168,000\ g$$

SAT # 8 - 16,17

	Cold	No Cold	Total
Vitamin C	21	129	150
Sugar Pill	33	117	150
Total	54	246	300

$$\frac{Cold}{Sugar\ Pill} = \frac{33}{150} = \frac{11}{50}$$

Age	Frequency	$x^* \times f$
18	6	108
19	5	95
20	4	80
21	2	42
22	1	44
23	1	46
30	1	30
Total :	20	445

$$18 + 18 + 18 + 18 + 18 + 18 + 19 + 19 + 19 + 19 + 19 + 20 + 20 + 20 + 20 + 21 + 21 + 22 + 22 + 30 = 445$$

$$mode = 18$$

18,18,18,18,18,18,19,19,19,19,19,20,20,20,20,21,21,22,22,30

$$Ave = \frac{19 + 19}{2} = 19$$

$20\ Numbers$
$Average\ \#\ 10{,}11$
$6 - 18's\ and\ 5 - 19's$

$$median = 19$$

$$mean = \frac{sum}{\#\ of\ data}$$

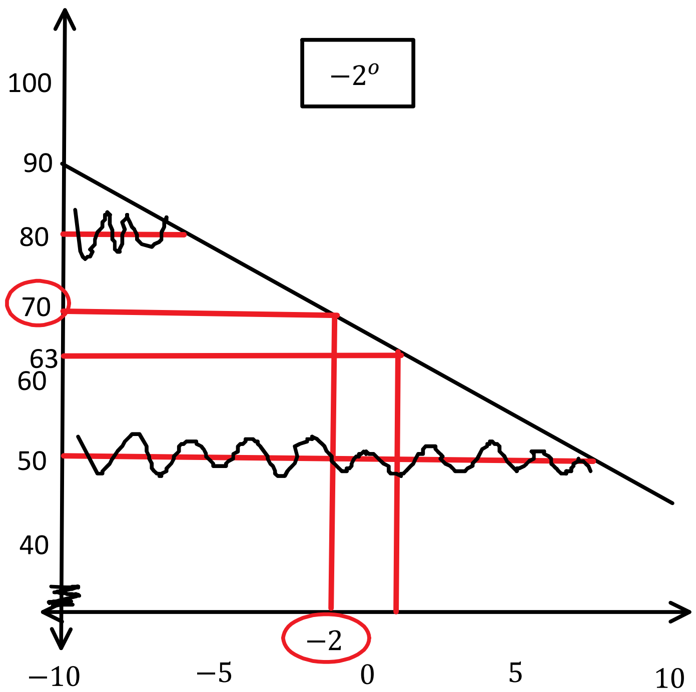
$$mean = \frac{445}{20}$$

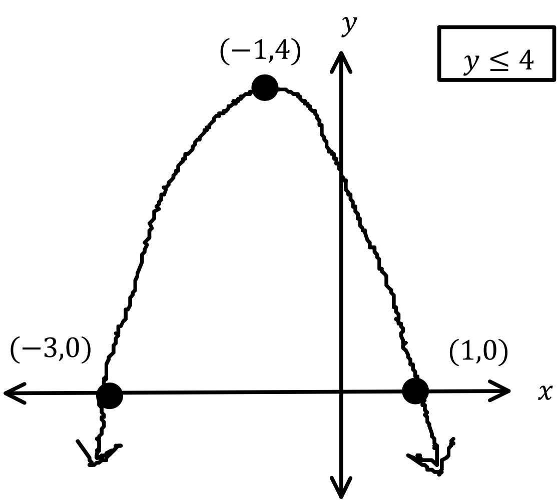
$$mean = 22.5$$

$$18 < 19 < 22.5$$

$$mode < median < mean$$

SAT # 8 - 18,19





$y \leq 4$

$$Ave = \frac{1 + (-3)}{2}$$

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

$x - int = -3 \ \& \ 0$

SAT # 8 - 20

$Annual\ Energy\ Average = \frac{\$4{,}334}{year}$ $\qquad$ $Heating\ System = \$25{,}000$

$Annual\ Energy\ Savings = \frac{\$2712}{year}$

$let\ t = \#\ of\ years\ after\ install$

$(4334 - 2712) = Cost\ Savingspee\ year$

$(4334 - 2712)t = Total\ Cost\ Savings$

$(4334 - 2712)t > 25000$
$t(4334 - 2712) > 25000$

OR

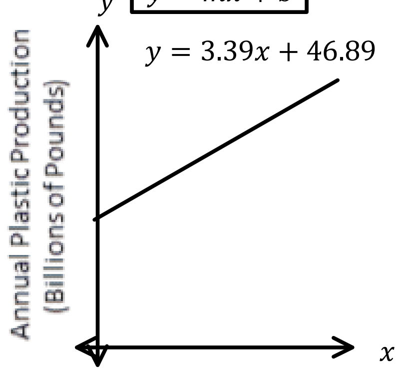
$let\ C = total\ cost$

With Install	Without Install
$C = 2712t + 25000$	$C = (4334t)$

$y = mx + b$

$(C) = 2712t + 25000$
$(4334t) > 2712t + 25000$
$-2712t \quad - 2711t$
$4334t - 2712t > 25000$ $\qquad$ $GCF = t$
$t(4334 - 2712) > 25000$

$y = mx + b$

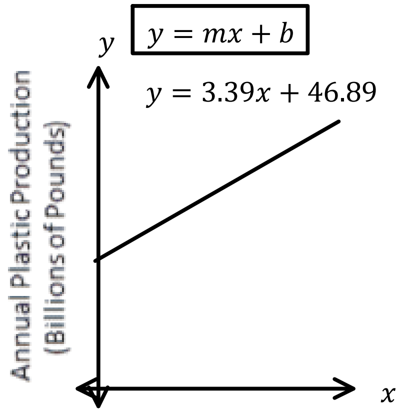


$\#\ of\ years\ since\ 1985$

$let\ x = \#\ of\ years\ since\ 1985$
$let\ y = annual\ plastic\ production$

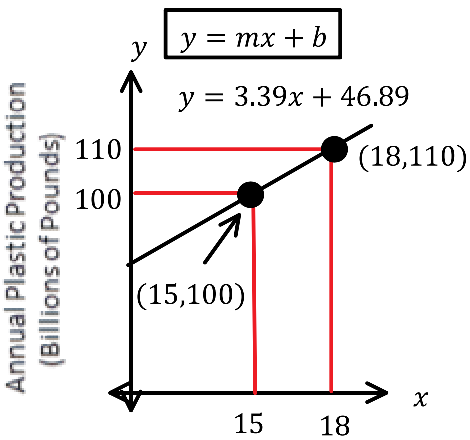
$$m = slope = \frac{rise}{run} = \frac{3.39\ Billion\ Pounds}{year}$$

SAT # 8 - 21,22



let x = # of years since 1985
let y = annual plastic production

$$m = slope = \frac{rise}{run} = \frac{3.39\ Billion\ Pounds}{year}$$



Year	Year Since 1955 (x)
1985	0
1986	1
1987	2
…	…
2000	15
2001	16
2002	17
2003	18

+13 +13

$$\%\ Change = \frac{Final - Initial}{Initial} \times 100\%$$
$$\%\ Change = \frac{110 - 100}{100} \times 100\%$$
$$\%\ Change = \frac{10}{100} \times 100\%$$
$$\%\ Change = 0.1 \times 100 = 10\%$$

SAT # 8 - 23,24,25

$M = 1800(1.02)^t$

let M = # of members
let t = years after opening
let q = # of quarter years after opening

$F = P(1+r)^t$
$M = 1800(1+0.02)^t$
$F = 1800(1.02)^t$

$r = 0.02 = 2\%$

$F = P(r)^{\frac{t}{T}}$
$F = 1800(1.02)^{\frac{q}{4}}$

$F = P\left(1+\frac{r}{n}\right)^{tn}$
$F = P\left(1+\frac{0.02}{4}\right)^{t(4)}$
$F = P(1+0.005)^{4t}$

t	m
0	1800
0.25	1808.93
1	1836
2	1872.72
3	1910.17

↔

q	m
0	1800
1	1808.93
2	1817.91
3	*1826.93*
4	*1836*

~~*10% of viewers voted.*~~

	Social Media	Text Message
Contestant #1	30%	60%
Contestant #2	70%	40%

Year	x	*Population*
2000	0	862
2010	10	846

$y = mx + b$

$y = mx + b$
$y = -1.6x + b$
$862 = -1.6(0) + b$
$862 = 0 + b$
$862 = b$

$d = -1.6x + 862$

$d = 872 - 1.6x$

(x_2, y_2) $(10{,}846)$ (x_1, y_1) $(0{,}862)$

$m = \frac{y_2 - y_1}{x_2 - x_1}$
$m = \frac{(846)-(862)}{(10)-(0)}$
$m = \frac{-16}{10} = \frac{rise}{run}$
$m = -1.6$

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

$y - (862) = -1.6(x - (0))$
$y - (862) = -1.6(x)$
$+862 \quad +862$
$y = -1.6x + 862$
$P(t) = 862 - 1.6x$

$(0{,}862)$

$y = P(t)$

SAT # 8 - 26,27

Biased

(x, y)

(p, r)

$$y = x + b$$
$$(r) = (p) + b$$
$$r = (p + b)$$

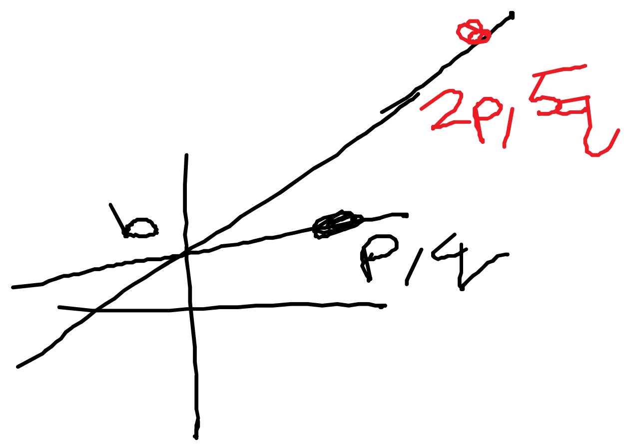
$$r = -4b + b$$
$$r = -3b$$

(x, y)

$(2p, 5r)$

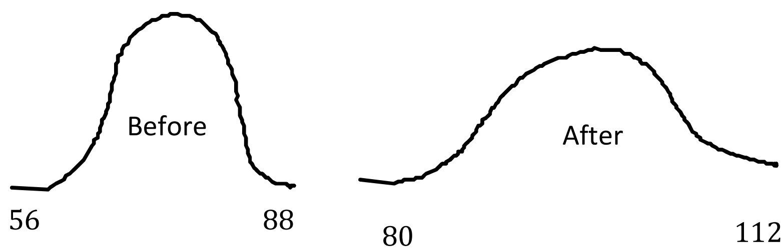
$$y = 2x + b$$
$$(5r) = 2(2p) + b$$
$$5(r) = 4p + b$$
$$5(p + b) = 4p + b$$
$$5p + 5b = 4p + b$$
$$-4p \qquad -4p$$
$$p + 5b = b$$
$$-5b \qquad -5b$$
$$p = -4b$$

$$\frac{r}{p} = \frac{4}{3}$$



SAT # 8 - 28,29,30

$22\ students : dots$



$88 - 56 = 32$ $\quad s_1 < s_2^*$ $\quad 112 - 80 = 32$

$r_2 = 32$ $\quad s_1 \neq s_2$ $\quad r_1 = 32$

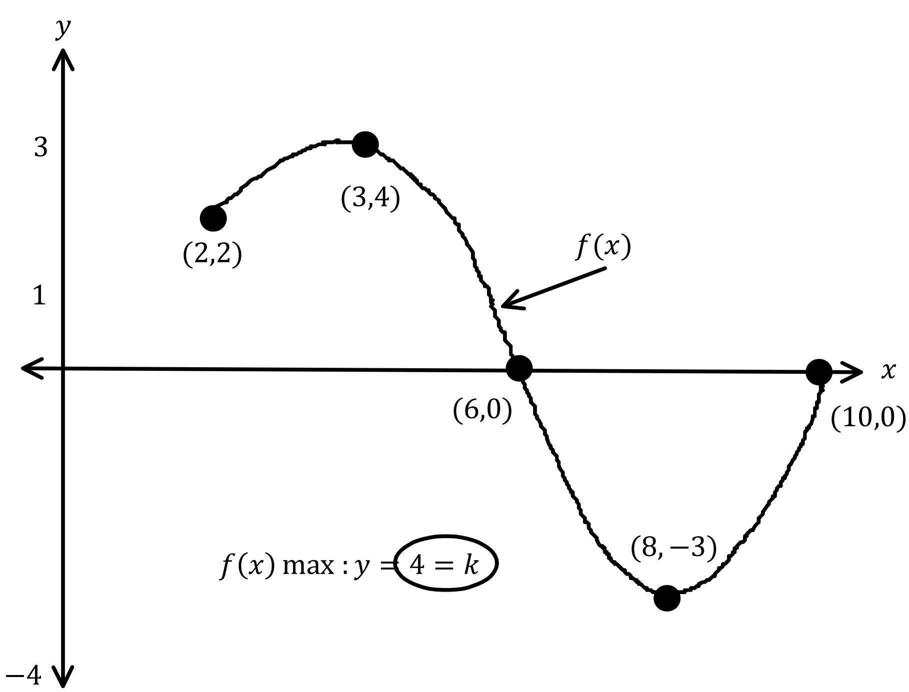
$r_1 = r_2$

$standard\ deviation : spread\ of\ data\ from\ mean\ (average)$

$range = \max - min$

$F = P(r)^{\frac{t}{T}}$ $\quad r = 30\% = 0.30$

$P = 5000(0.70)^{\frac{t}{20}}$ $\quad 1 - 0.30 = 0.70 = 70\%$



$f(x)\ \max : y = 4 = k$

x	$g(x)$
−2	1
−1	2
0	3
1	4
2	5
3	6
4	7

$g(k) = ?$

$g(4) = 7$

SAT # 8 - 31,32,33,34

H_2O Water

$2 - Hydrogen$
$1 - Oxygen$

$Over = Over$

$\frac{\square}{\square} = \frac{\square}{\square}$

$$51\ H_20\ molecules \times \frac{2\ atoms\ Hydrogen}{1\ molecule\ H_20} = 102\ atoms\ Hydrogen$$

$(x) - \frac{1}{2}a = 0$

$(1) - \frac{1}{2}a = 0$ $x = 1$

$1 - \frac{1}{2}a = 0$

$-1 \quad -1$

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

$2 \times -\frac{1}{2}a = -1 \times 2$

$-a = -2$

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

$a = 2$

$1 - \frac{1}{2}a = 0$

$\left(1 - \frac{1}{2}a = 0\right) \times 2$

$2 - a = 0$

$+a \quad +a$

$a = 2$

$x + 2y = 10$

$(x + 2y = 10) \times 3$

$3x + 6y = 30$

$3x + 6y = c$

$c = 30$

$\frac{11miles}{26minutes} =$

$\frac{11miles}{0.43333hr} =$

$\frac{25.38miles}{hr} =$

$\frac{25.4miles}{hr}$

$$26minutes \times \frac{1hr}{60min} = 0.43333..hr$$

$\frac{11miles}{\left(\frac{26minutes}{60minutes}\right)} =$

$11 \div \frac{26}{60}$

$11 \times \frac{60}{26} = \frac{660}{26} = \frac{330}{13} = 25.38$

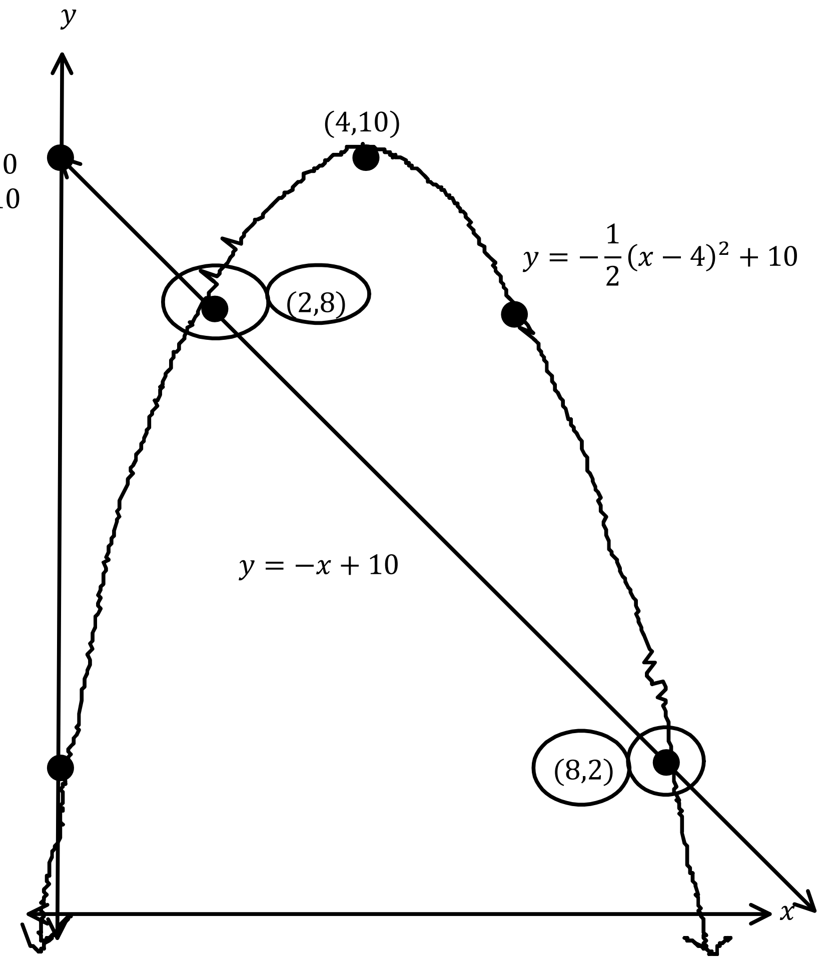
SAT # 8 - 35

$f(x) = -\frac{1}{2}(x-4)^2 + 10$

$y = -\frac{1}{2}(x-4)^2 + 10$

$g(x) = -x + 10$

$y = -x + 10$



$a = 8$ $a = 2$ $f(a) = g(a)$

$$-\frac{1}{2}(x-4)^2 + 10 = -x + 10$$
$$-10 \qquad -10$$
$$-\frac{1}{2}(x-4)^2 = -x$$
$$-\frac{1}{2}(x^2 - 8x + 16) = -x$$
$$-\frac{1}{2}x^2 + 4x - 8 = -x$$
$$\left(-\frac{1}{2}x^2 + 4x - 8 = -x\right) = -2$$
$$x^2 - 8x + 16 = 2x$$
$$-2x \qquad -2x$$
$$x^2 - 10x + 16 = 0$$
$$(x-8)(x-2) = 0$$

$$(x-4)(x-4)$$
$$x^2 - 4x - 4x + 16$$
$$x^2 - 8x + 16$$

$$-\frac{1}{2}(x-4)^2 = -x$$
$$\left(-\frac{1}{2}(x-4)^2 = -x\right) \times -2$$
$$(x-4)^2 = -2x$$
$$x^2 - 8x + 16 = -2x$$

$x - 8 = 0$ $x - 2 = 0$

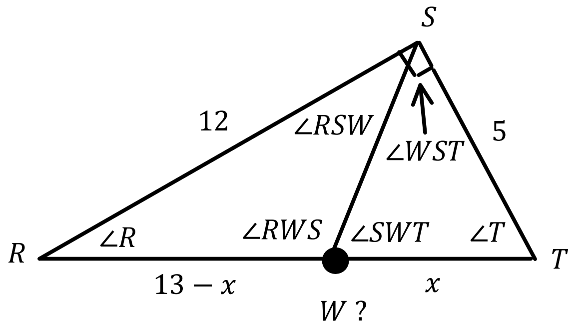
$x = 8$ $x = 2$

$a = 8$ $a = 2$ $f(a) = g(a)$

$a = x$

$$g(x) = -x + 10$$
$$y = -x + 10$$
$$+x \qquad +x$$
$$y + x = 10$$
$$-y \qquad -y$$
$$x = 10 - y$$

SAT # 8 - 36



$$a^2+b^2=c^2$$
$$5^2+12^2=c^2$$
$$25+133=c^2$$
$$169=c^2$$
$$c=13$$

$$\cos(\angle RSW)-\sin(\angle WST)=0 \qquad \boxed{\sin(\angle WST)=\cos(\angle RSW)}$$

$$\frac{13-x}{\sin(\angle RSW)}=\frac{12}{\sin(\angle RWS)}$$
$$\frac{13-x}{\sin(90^o-\angle WST)}=\frac{12}{\sin(\angle RWS)}$$
$$\frac{13-x}{\cos(\angle WST)}=\frac{12}{\sin(\angle RWS)}$$

$$\boxed{\begin{aligned}\angle RSW+\angle WST&=90^0\\ \angle RSW&=90^o-\angle WST\end{aligned}}$$

$$\frac{x}{\sin(\angle WST)}=\frac{5}{\sin(\angle TWS)}$$
$$\frac{x}{\sin(\angle WST)}=\frac{5}{\sin(180^o-\angle RWS)}$$
$$\frac{x}{\sin(\angle WST)}=\frac{5}{\sin(\angle RWS)}$$

$$\boxed{180^o-\angle RWS=\angle SWT}$$

$$\begin{aligned}\sin(90^o-\angle WST)&=sin90\cos(\angle WST)-cos90\sin(\angle WST)\\&=\cos(\angle WST)-0\\&=\cos(\angle WST)\end{aligned}$$

$$\boxed{\begin{aligned}\sin(180^o-\angle RWS)&=sin180\cos(\angle RWS)-cos180\sin(\angle RWS)\\&=0-(-1)\sin(\angle RWS)\\&=\sin(\angle RWS)\end{aligned}}$$

$$\frac{13-x}{\cos(\angle WST)}=\frac{12}{\frac{5\sin(\angle WST)}{x}}$$
$$\frac{13-x}{\cos(\angle WST)}=\frac{12x}{5\sin(\angle WST)}$$

$$\frac{x}{\sin(\angle WST)}=\frac{5}{\sin(\angle RWS)}$$
$$\sin(\angle RWS)=\frac{5\sin(\angle WST)}{x}$$

$$\frac{13-x}{\cos(90^o-\angle RSW)}=\frac{12x}{5\sin(\angle WST)}$$
$$\frac{13-x}{-\sin(\angle RSW)}=\frac{12x}{5\sin(\angle WST)}$$

$$\boxed{\begin{aligned}\angle RSW+\angle WST&=90^0\\ \angle WST&=90^o-\angle RSW\end{aligned}}$$

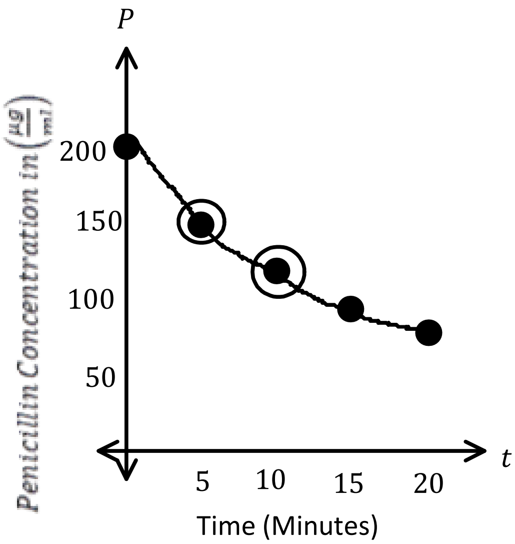
$$\begin{aligned}\cos(90-\angle RSW)&=cos90\cos(\angle RSW)+sin90\sin(\angle RSW)\\&=0-1(\angle RSW)\\&=-\sin(\angle RSW)\end{aligned}$$

$\sin(\angle RSW)=$ $\qquad$ $\cos(\angle RSW)=$

$$\cos\big(2(\angle RSW)\big)=1-2\sin^2(\angle RSW)$$
$$\sin(\angle RSW)=\frac{1-\cos(2(\angle RSW))}{2}$$

SAT # 8 - 37,38

Minutes After Injection (t)	Penicillin Concentration (P) $\left(\frac{\mu g}{ml}\right)$
0	200
5	152
10	118
15	93
20	74



$let\ P = Penicillin\ Concentration\ in\ \left(\frac{\mu g}{ml}\right)$

$let\ t = time\ after\ injection\ (min)$

(5,

$\frac{?\ \mu g}{10ml}$ @ $5\ min$

$\frac{?\ \mu g}{8\ ml}$ @ $10\ min$

37) 576=24^2
38) 0.8

$P(t) = 200b^{\frac{t}{5}}$

$P(5) = 200b^{\frac{10}{5}}$

$P(10) = 200b^{\frac{10}{5}}$