

099 §2.2 #5 1-22 odds, 29-67, 79, 81, 83

#5-4 Use $3x-4y=12$ as given. Solve for y

$$\textcircled{1} x=0 \implies 3(0)-4y=12$$

$$-4y=12$$

$$y = \frac{12}{-4} = -3 = y$$

$$y \in \{-3\}$$

$$\textcircled{3} x=4 \implies 3(4)-4y=12$$

$$12-4y=12$$

$$-4y=0$$

$$y \in \{0\}$$

#55-8
Use $y=2x-3$ to find x $y = \frac{0}{-4} = 0 = y$

$$\textcircled{5} y=0 \implies 2x-3=0$$

$$2x=3$$

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

$$x \in \left\{ \frac{3}{2} \right\}$$

$$\textcircled{7} y=5 \implies 5=2x-3$$

$$8=2x$$

$$2x=8 \text{ style}$$

$$x = \frac{8}{2} = 4$$

$$x \in \{4\}$$

099 §2.2 #s 9-23, 29-67, 79-83

~~1~~ #s 9-24 Problems from later on...

9 $x - 2y = 4$ and $y = -\frac{6}{5}$. Find x

$$x - 2\left(-\frac{6}{5}\right) = 4$$

$$x + \frac{12}{5} = 4$$

$$\frac{5x + 12}{\text{LCD}} = \frac{20}{\text{LCD}}$$

$$5x + 12 = 20$$

$$5x = 8$$

$$x = \frac{8}{5}$$

$$x \in \left\{ \frac{8}{5} \right\}$$

Solve for 'a' :

11 $x = 160, y = 0$ and $y = a(x - 80)^2 + 70 \Rightarrow$

$$a(160 - 80)^2 + 70 = 0$$

$$a(80)^2 + 70 = 0$$

$$6400a + 70 = 0$$

$$6400a = -70$$

$$a = -\frac{70}{6400} = -\frac{7}{640}$$

$$a \in \left\{ -\frac{7}{640} \right\}$$

099 § 2.2 #s 13-23, 29-67, 79-83

(13) $\$ p = 1.5$ & $R = (900 - 300p)p$.

Find R :

$$R = (900 - 300(1.5))(1.5)$$

$$= (900 - 450)(1.5)$$

$$= (450)(1.5)$$

$$= 675 = R$$

$$R \in \{675\}$$

(15) Find P if $P = -.1x^2 + 27x + 1700$, and ...
 $= P(x)$

(a) ... $x = 100 \rightarrow$

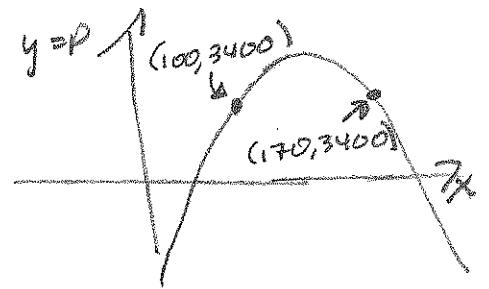
$$P(100) = -.1(100)^2 + 27(100) + 1700$$

$$= -.1(10000) + 2700 + 1700$$

$$= -1000 + 4400$$

$$= 3400 = P(100)$$

$$P \in \{3400\}$$



\rightarrow "P of 100"

"What P is when we feed
it $x = 100$."

(b) ... $x = 170 \rightarrow P(170) = -.1(170)^2 + 27(170) + 1700$

$$= -.1(28900) + 4590 + 1700$$

$$= -2890 + 6290 = 3400 = P(170)$$

$$\Rightarrow P \in \{3400\}$$

099 § 2.2 #s 17-23, 29-67, 79-83

(17) Find h if $h = h(t) = -16t^2 + 32t + 16$
" h' of t "

and...

(a) ... $t = \frac{1}{4}$ $h(\frac{1}{4}) = -16(\frac{1}{4})^2 + 32(\frac{1}{4}) + 16$
 $= -16(\frac{1}{16}) + 8 + 16$
 $= -1 + 24 = \boxed{23 = h(\frac{1}{4})}$

(b) ... $t = \frac{7}{4}$ $h(\frac{7}{4}) = -16(\frac{7}{4})^2 + 32(\frac{7}{4}) + 16$
 $= -16(\frac{49}{16}) + 8(7) + 16$
 $= -49 + 72 = \boxed{23 = h(\frac{7}{4})}$

(19) Let $d = 30$, $r = 12$, $t = 13$ find c

$d = (r - c)t$ Find c .

$30 = (12 - c)(13)$

$30 = 156 - 13c$

$-126 = -13c$

$-13c = -126$

$c = \frac{-126}{-13} = \boxed{\frac{126}{13} = c}$

099 §2.2 #s 21-23, 29-67, 79, 81, 83

(21) $y = kx$, $x = 5$ & $y = 15 \rightarrow$

$$15 = (k)(5) = 5k$$

$$5k = 15$$

$$k = \frac{15}{5} = \boxed{3 = k}$$

(23) $V = \frac{k}{P}$, $P = 48$ & $V = 50 \Rightarrow$

$$50 = \frac{k}{48}$$

$$\frac{1}{48} k = 50$$

$$k = (50)(48) = \boxed{2400 = k}$$

#s 29-60 Solve for the indicated variable

(29) $d = rt$ for t : $\boxed{t = \frac{d}{r}}$

(31) $d = (r+c)t$ for t :

$$t(r+c) = d$$

$$\boxed{t = \frac{d}{r+c}}$$

099 §2.2 #5 33-67, 79-83

33 $A = lw$ for l

$$\boxed{\frac{A}{w} = l}$$

35 $I = prt$ for t

$$prt = I$$

$$\boxed{t = \frac{I}{pr}}$$

37 $PV = nRT$ for T

$$nRT = PV$$

$$\boxed{T = \frac{PV}{nR}}$$

39 $y = mx + b$ for x

$$mx + b = y$$

$$mx = y - b$$

$$\boxed{x = \frac{y - b}{m}}$$

41 $C = \frac{5}{9}(F - 32)$ for F

$$\frac{5}{9}(F - 32) = C$$

$$\frac{5(F - 32)}{9} = \frac{C}{1} \cdot \frac{9}{9}$$

$$5(F - 32) = 9C$$

$$5F - 160 = 9C$$

$$5F = 9C + 160$$

$$\boxed{F = \frac{9C + 160}{5}}$$

$$\text{OR } \frac{9}{5}C + 32$$

099 S 2.2 #s 43-67, 79-83

(43) $h = vt + 16t^2$ for v

$$vt + 16t^2 = h$$

$$vt = -16t^2 + h$$

$$v = \frac{-16t^2 + h}{t}$$

(45) $A = a + (n-1)d$ for d

$$a + (n-1)d = A$$

$$(n-1)d = A - a$$

$$d = \frac{A - a}{n - 1}$$

(47) $2x + 3y = 6$ for y

$$3y = -2x + 6$$

$$y = \frac{-2x + 6}{3}$$

$$\text{OR } y = -\frac{2}{3}x + 2$$

(49) $-3x + 5y = 15$ for y

$$5y = 3x + 15$$

$$y = \frac{3x + 15}{5}$$

$$\text{OR } y = \frac{3}{5}x + 3$$

099 § 2.2 #5 51-67, 79-83

51 $2x - 6y + 12 = 0$ for y

$$-6y = -2x - 12$$

$$y = \frac{-2x - 12}{-6} = \frac{-2(x + 6)}{-6} = \boxed{\frac{x + 6}{3} \text{ OR } \frac{1}{3}x + 6 = y}$$

53 $ax + 4 = bx + 9$ for x

$$ax - bx = 5$$

$$x(a - b) = 5$$

$$\boxed{x = \frac{5}{a - b}}$$

55 $S = \pi r^2 + 2\pi r h$ for h

$$2\pi r h + \pi r^2 = S$$

$$2\pi r h = -\pi r^2 + S$$

$$\boxed{h = \frac{-\pi r^2 + S}{2\pi r}}$$

$$\text{OR } \frac{-\pi r^2}{2\pi r} + \frac{S}{2\pi r} = -\frac{1}{2}r + \frac{S}{2\pi r}$$

57 $-3x + 4y = 12$ for x

$$-3x = -4y + 12$$

$$\boxed{x = \frac{-4y + 12}{-3}}$$

$$\text{OR } \frac{4y - 12}{3} \text{ OR } \frac{4}{3}y - 4$$

099 § 2.2 #s 59-67, 79-83

(59) $ax + 3 = cx - 7$ for x

$$2x - cx = -10$$

$$x(2-c) = -10$$

$$x = \frac{-10}{2-c} \text{ or } \frac{10}{c-2} \text{ or } \dots$$

(61) #s 61-68 solve for y .

$$x = 2y - 3$$

$$2y - 3 = x$$

$$2y = x + 3$$

$$y = \frac{x+3}{2} = \frac{1}{2}x + \frac{3}{2}$$

(63) $y - 3 = -2(x + 4)$

$$y - 3 = -2x - 8 \quad \text{Add 3}$$

$$y = -2x - 5$$

(65) $y - 3 = -\frac{2}{3}(x + 3) = \frac{-2(x+3)}{3}$

$$\frac{(y-3)}{1} \cdot \frac{3}{3} = \frac{-2(x+3)}{3}$$

$$\frac{3y-9}{LCD} = \frac{-2x-6}{LCD}$$

$$3y - 9 = -2x - 6$$

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

$$y = \frac{-2x+3}{3} \text{ or } -\frac{2}{3}x + 1$$

099 §2.2 #s 67, 79-83

(67) $y - 4 = -\frac{1}{2}(x + 1)$ TIMES 2: $2y - 8 = -(x + 1)$

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

$$2y - 8 = -x - 1$$

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

etc.

$$\frac{2y - 8}{2} = \frac{-x - 1}{2}$$

$$2y - 8 = -x - 1$$

$$2y = -x + 7$$

$$\boxed{y = \frac{-x + 7}{2}} \text{ OR } -\frac{1}{2}x + \frac{7}{2}$$

(79) Let h = height of bullet (in feet)
and t = time (in seconds)

Given $\boxed{h = h(t) = -16t^2 + 80t + 96}$

means h is a function of t

When will bullet be 192 ft in the air?

$$h(t) = 192 \text{ when?}$$

$$h(t) = -16t^2 + 80t + 96 = 192$$

$$-16t^2 + 80t - 96 = 0$$

$$-16(t^2 - 5t + 6) = 0$$

$$t^2 - 5t + 6 = 0$$

$$(t - 3)(t - 2) = 0$$

$$\boxed{t \in \{2, 3\}}$$

009 \$1.2 #s 81, 83

(81) Boat takes 2 hrs to travel 18 miles upstream. Speed of boat is 15 mph in still water. What's speed of current

$D = rt$ prob.

Let $c =$ speed of current ($\frac{mi}{hr}$)

Dist	rate	time
18 mi	$15 - c$ $\frac{mi}{hr}$	2 hr

$$D = rt$$

$$18 = (15 - c)(2)$$

$$18 = 30 - 2c$$

$$-2c + 30 = 18$$

$$-2c = -12$$

$$c = \frac{-12}{-2} = 6 \frac{mi}{hr} = c$$

~~83~~ (84!?) It takes 3 hrs to travel 39 miles against wind, wind is $4 \frac{mi}{hr}$. How fast is cyclist on windless day?

Let $r =$ rate without wind ($\frac{mi}{hr}$)

Dist	rate	time
39 mi	$r - 4$ $\frac{mi}{hr}$	3 hrs

$$39 = (r - 4)(3) = 3r - 12$$

$$3r - 12 = 39$$

$$3r = 51$$

$$r = \frac{51}{3} = 17 \frac{mi}{hr}$$

099 § 212 # 83

(83) Takes 4 hrs to travel 864 mi ~~to~~
against the wind. Speed on windless day
is $258 \frac{\text{mi}}{\text{hr}}$. What's wind speed?

Let $w = \text{wind speed} \left(\frac{\text{mi}}{\text{hr}} \right)$

Dist	rate	time
864 mi	$258 - w \frac{\text{mi}}{\text{hr}}$	4 hrs

$$D = rt = D$$

$$(258 - w)(4) = 864$$

$$1032 - 4w = 864$$

$$-4w = -168$$

$$w = \frac{-168}{-4} = 42 \frac{\text{mi}}{\text{hr}} = w$$