Worksheet 3 Solutions

(1) Monday was used 12% so find $(12)(1.5) = 12\left(\frac{3}{2}\right)$

$= \frac{12 \cdot 3}{2} = \frac{6 \cdot 3}{1} = 18\%$

Ans: Wednesday

(2) Percentage of students <u>not</u> in geometry & precalculus

$= 26\% + 33\% = 59\%$

(calc, alg.)

Find $4500 \cdot 59\% = (4500)(0.59) =$ **2655 students**

(3) Compare differences of current day − previous day

the largest is **Friday** $15\% - 32\% = -17\%$

(4) $(4, 7)$

(5) $(0, 1/3)$

(6) & plug the point into the ~~solution~~. equation

$2x - 3y = 1 \quad x = 0, \; y = 1/3$

$2(0) - 3(1/3) = 1$

$-1 = 1$ false! **The point is not a solution**

(7) $5x - 2y = 6 \quad x = 2, \; y = -2$

$5(2) - 2(2) = 6$

$10 - 4 = 6$

$6 = 6$ ✓ an identity! **The point is a Solution**

(8) $5x + 4y = 10$

a) $\boxed{(2, 0)}$

$x = 2$

$5(2) + 4y = 10$

$10 + 4y = 10$

$-10 \quad -10$

$4y = 0$

$y = 0$

b) $(4, -\frac{5}{2})$

$x = 4$

$5(4) + 4y = 10$

$20 + 4y = 10$

$-20 \quad -20$

$\frac{4y}{4} = \frac{-10}{4}$

$y = -\frac{10}{4} = -\frac{5}{2}$

c) $(0, \frac{5}{2})$

$x = 0$

$5(0) + 4y = 10$

$4y = 10$

$y = \frac{10}{4}$

$y = 5/2$

d) $(2, 0)$

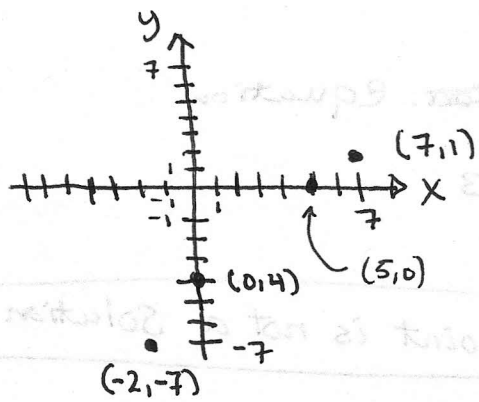
$y = 0$

$5x + 4(0) = 10$

$5x = 10$

$x = 2$

(9)



(10) $x + y = 3$

$\boxed{(0, 3)}$

$0 + y = 3$

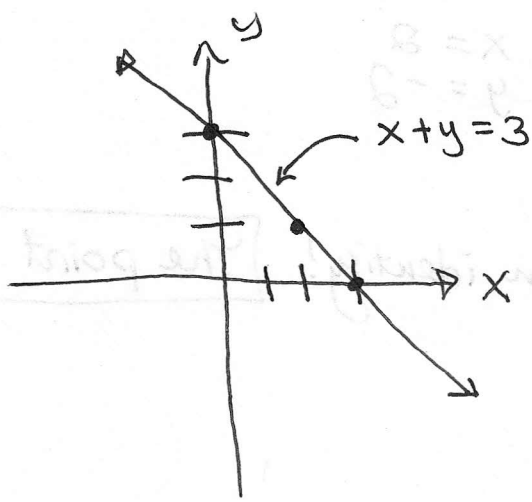
$\boxed{(3, 0)}$

$x + 0 = 3$

$\boxed{(2, 1)}$

$2 + y = 3$

$y = 1$



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(11) $2y - 4 = x$

$(0, \underline{2})$

$2y - 4 = 0$

$2y = 4$

$y = 2$

$(\underline{-4}, 0)$

$2(0) - 4 = x$

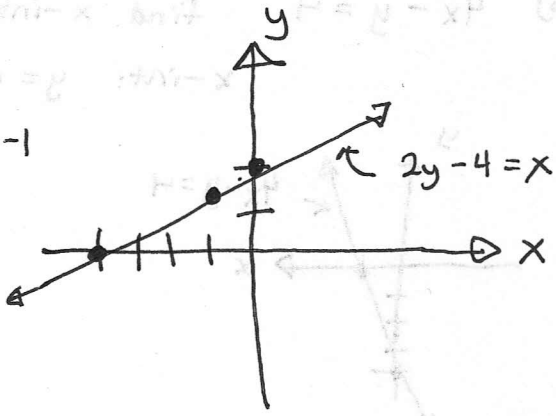
$-4 = x$

$(-1, \underline{3/2})$

$2y - 4 = -1$

$2y = 3$

$y = 3/2$



(12)

x-int

$y = 0$

$3x + 2(0) = 12$

$3x = 12$

$x = 4$

$\boxed{(4, 0)}$

y-int

$x = 0$

$3(0) + 2y = 12$

$2y = 12$

$y = 6$

$\boxed{(0, 6)}$

(13)

x-int

$y = 0$

$5x - 2y = 10$

$5x - 2(0) = 10$

$5x = 10$

$x = 2$

$\boxed{(2, 0)}$

y-int

$x = 0$

$5(0) - 2y = 10$

$-2y = 10$

$y = -5$

$\boxed{(0, -5)}$

(14) Find x-int & y-int of equation first then graph

$3x + y = 6$

x-int

$y = 0$

$3x + 0 = 6$

$3x = 6$

$x = 2$

$(2, 0)$

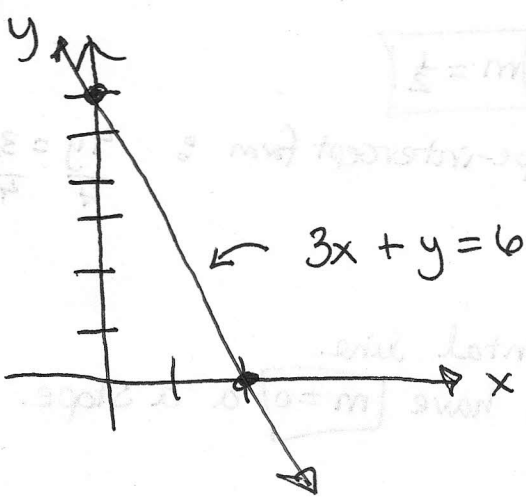
y-int

$x = 0$

$3(0) + y = 6$

$y = 6$

$(0, 6)$



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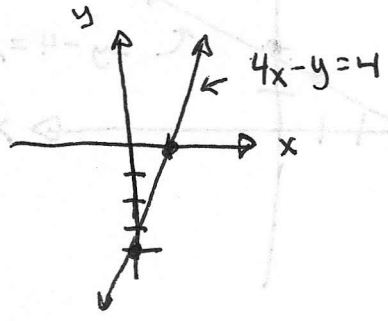
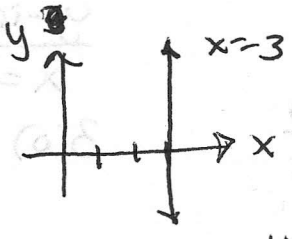
(15) $4x - y = 4$ find x-intercept and y-intercept then graph

x-int: $y = 0$ $\quad 4x - 0 = 4$ $\quad 4x = 4$ $\quad x = 1$ $\quad \boxed{(1,0)}$

y-int: $x = 0$ $\quad 4(0) - y = 4$ $\quad -y = 4$ $\quad y = -4$ $\quad \boxed{(0,-4)}$

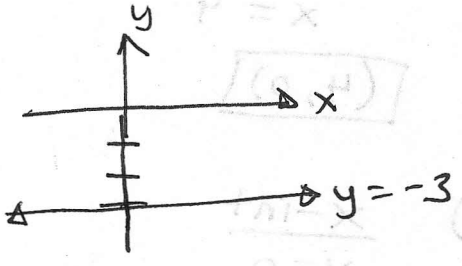


(16) $x = 3$ This is a vertical line



(17) $y + 3 = 0$ This is a horizontal line

$y = -3$



(18)

$x=0$	1990
$x=1$	1991
$x=2$	1992
$x=3$	1993
$x=4$	1994

at $x=0$ $\quad y = -85(0) + 2435$

$= 2435$

at $x=2$ $\quad y = -85(2) + 2435 = 2265$

at $x=4$ $\quad y = -85(4) + 2435 = 2095$

(19) Find slope: $(4,3), (3,5)$ $\quad m = \frac{5-3}{3-4} = \frac{2}{-1} = \boxed{-2}$

(20) Find slope: $(-3,2), (7,4)$ $\quad m = \frac{4-2}{7-(-3)} = \frac{4-2}{7+3} = \boxed{\frac{2}{10}}$

(21) $y = mx + b \Rightarrow \boxed{m = \frac{1}{2}}$

(22) Rewrite in slope-intercept form: $\frac{4y}{4} = \frac{3x}{4} + \frac{7}{4} \rightarrow y = \frac{3}{4}x + \frac{7}{4}$

$\boxed{m = \frac{3}{4}}$

(23) $y = -4$

This is a horizontal line.

Horizontal lines have $\boxed{m = 0}$ a a slope.

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(24) $x = 3$ This is a vertical line. Vertical lines have **no slope**

(25) $y = -5x - 2$ → $m = -5$
$y = 5x - 2$ $m = 5$

- The slopes are not the same → not parallel
- The slopes are not negative reciprocals → not perpendicular

neither

(26) $2x + 2y = 7$ (1)
$2x - 2y = 5$ (2)

Rewrite both equations so they are in slope-intercept form.

eqn (1): $2x + 2y = 7$
$-2x \quad -2x$
$\frac{2y}{2} = \frac{7 - 2x}{2}$
$y = \frac{7}{2} - \frac{2}{2}x$
$y = \frac{7}{2} - 1x$

$m = -1$

eqn (2): $2x - 2y = 5$
$-2y = 5 - 2x$
$y = -\frac{5}{2} + \frac{2}{2}x$
$y = -\frac{5}{2} + x$

$m = 1$

The slopes are negative reciprocals → they are perpendicular

(27) $\begin{cases} y + 4 = 0 \\ y - 7 = 0 \end{cases}$

Both are horizontal lines so they both have the slope **$m = 0$** therefore they are **parallel.**

(28) $\begin{cases} y = 9 \\ x = 0 \end{cases}$

$y = 9$ is a horizontal line while $x = 0$ is a vertical line. Even though the slopes aren't negative reciprocals, the lines are **perpendicular.**

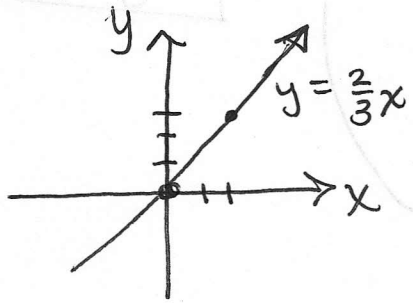
(29) $y = mx + b$

$y = -2x + 0$

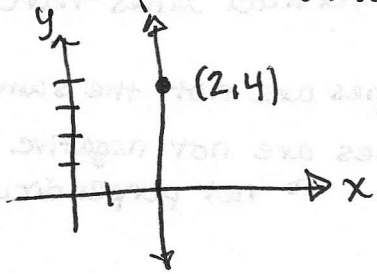
(30) **$y = -\frac{1}{2}x - 3$**

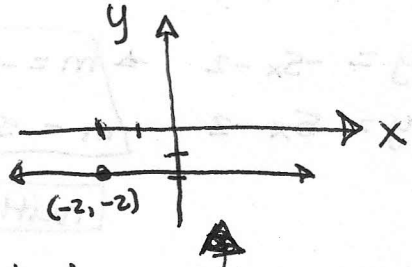
(31) Write in slope intercept form

$y + 2 = \frac{2}{3}(x + 3)$
$y = \frac{2}{3}(x + 3) - 2$
$y = \frac{2}{3}x + 2 - 2$
$y = \frac{2}{3}x + 0$



(32) Since slope is undefined, the line is vertical





(33) $(-2,-2)$ $m=0$ This is a horizontal line graph

(34)

$y-(-7)=\frac{3}{4}(x-(-4))$

$y+7=\frac{3}{4}(x+4)$

$y=\frac{3}{4}(x+4)-7$

$y=\frac{3}{4}x+3-7$

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

$4\cdot y=4\cdot(\frac{3}{4}x-4)$

$4y=3x-16$

$\boxed{4y-3x=-16}$

(35)

$y-4=2(x-(-2))$

$y-4=2x+4$

$y=2x+8$

$\boxed{y-2x=8}$

(36) Find slope: $m=\frac{5-3}{7-2}=\frac{2}{5}$

$y-3=\frac{2}{5}(x-2)$

$y=\frac{2}{5}(x-2)+3$

$y=\frac{2}{5}x-\frac{2}{5}(2)+3$

$y=\frac{2}{5}x-\frac{4}{5}+3$

$y=\frac{2}{5}x-\frac{4}{5}+\frac{15}{5}$

$y=\frac{2}{5}x+\frac{11}{5}$

$5\cdot y=5\cdot(\frac{2x}{5}+\frac{11}{5})$

$5y=2x+11$

$\boxed{5y-2x=11}$

(37) Find slope $m = \frac{-4-2}{-2-7} = \frac{-6}{-9} = \frac{6}{9} = \frac{2}{3}$

$y - 2 = \frac{2}{3}(x-7)$

$y = \frac{2}{3}(x-7)+2$

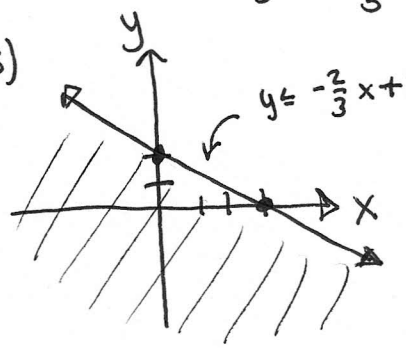
$y = \frac{2}{3}x - \frac{14}{3} + 2$

$3 \cdot y = 3\left(\frac{2}{3}x - \frac{14}{3} + 2\right)$

$3y = 2x - 14 + 6$

$\boxed{3y - 2x = -8}$

(38)



Test point (0,0)

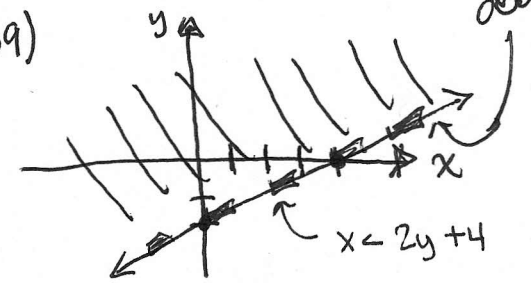
$y \leq -\frac{2}{3}x + 2$

$0 \leq -\frac{2}{3}(0) + 2$

$0 \leq 2$ ✓ true

Shade region where (0,0) lies

(39)



Test point (0,0)

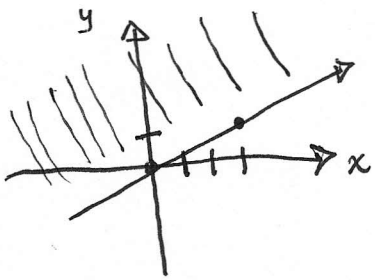
$x < 2y + 4$

$0 < 2(0) + 4$

$0 < 4$ ✓ true

Shade region where (0,0) lies

(40)



Test point (3,0)

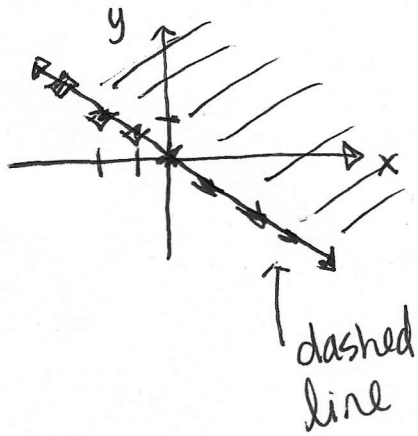
$y \geqslant \frac{1}{3}x$

$0 \geqslant \frac{1}{3}(3)$

$0 \geqslant 1$ false

Shade region where (3,0) does not lie

(41)



Test point (0,1)

$x > -2y$

$0 > -2(1)$

$0 > -2$ ✓ true

Shade region where (0,1) lies

Worksheet 3 Solutions

(42) Domain: $\{1, 2, 3, 4\}$, Range: $\{4\}$

(43) Domain: $\{6, 7, 8\}$, Range: $\{8, 9, 10\}$

(44) function

(45) function

(46) $f(x) = 8 - 5x$

$f(2) = 8 - 5(2) = -2$

$f(-1) = 8 - 5(-1) = 13$

(47) $f(x) = -x^2 + 8x - 2$

$f(2) = -(2)^2 + 8(2) - 2 = 10$

$f(-1) = -(-1)^2 + 8(-1) - 2 = -11$

(48) $f(x) = |x - 5|$

$f(2) = |2 - 5| = 3$

$f(-1) = |-1 - 5| = |-6| = 6$