Algebra 2 HON- Chapter 2 –Review

Evaluate $f(x) = -3|x-5| - 2$ when $x = 3$

Evaluate $f(5)$ where

$$f(x) = \begin{cases} 3x + 9, & \text{if } x \le 3 \\ 2x - 3, & \text{if } x > 3 \end{cases}$$

Tell whether the line is parallel, perpendicular or neither.
Line 1: (2, 10) and (1, 5)
Line 2: (3, -7) and (8, -8)

In problem #3, which line is steeper?

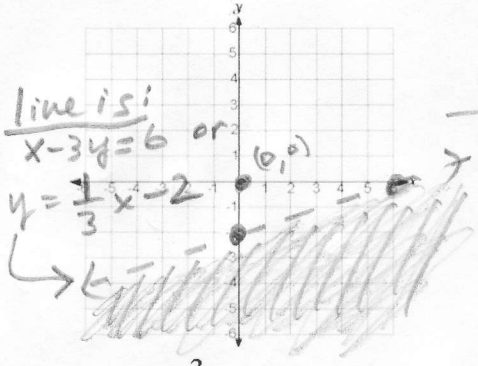
Write an equation in standard form if $m = \frac{1}{3}$ and passes through (3, -4).

Write an equation in standard form if it passes through the points (9, -6) and (3, -10)

Write in slope-intercept form (a) parallel to, (b) perpendicular to $y = -\frac{1}{3}x + 2$ that passes through (4, -3)

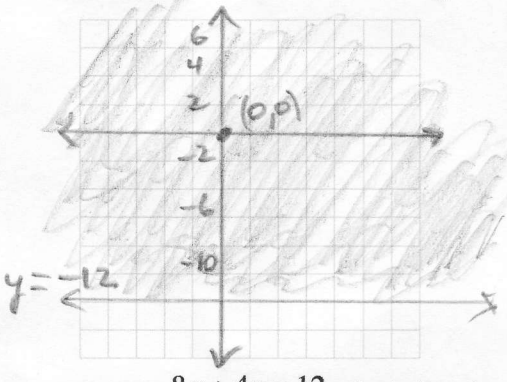
8. Mirror Length: To be able to see your complete reflection in a mirror that is hanging on a wall, the mirror must have a minimum length of m inches. The value of m varies directly with your height h (in inches). A person 71 inches tall requires a 35.5 inch mirror. Write a linear model that gives m as a function of h. Then find the minimum mirror length required for a person who is 66 inches tall.

9. Graph: $x > 3y + 6$



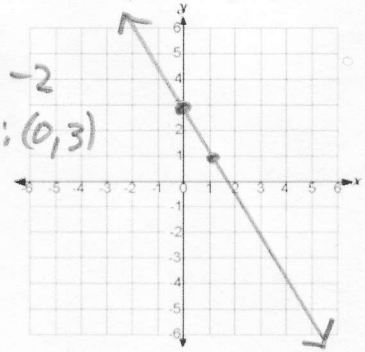
$x - 3y = 6$
x: (6,0)
y: (0,-2)
test (0,0)
$0 > 3(0) + 6$
$0 > 6$?
No

10. Graph: $-\frac{3}{4}y \le 9$



$\left(-\frac{4}{3}\right) -\frac{3}{4}y \le 9\left(-\frac{4}{3}\right)$
$y \ge -12$
slope interc. form
$0 \ge -12$?
yes

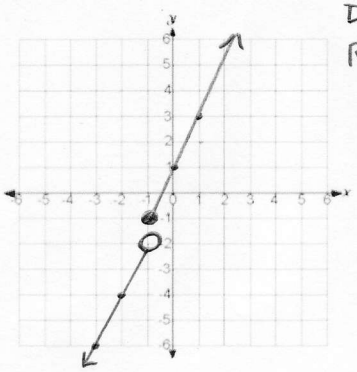
11. Given: $8x + 4y = 12$, find the slope, y-intercept, and graph



Slope: -2
y inter: (0,3)

$\frac{8x}{4} + \frac{4y}{4} = \frac{12}{4}$
$2x + y = 3$
or
$y = -2x + 3$
↑ slope ↑ y inter

12. Graph: $y = \begin{cases} 2x, & \text{if } x < -1 \\ 2x + 1, & \text{if } x \geq -1 \end{cases}$

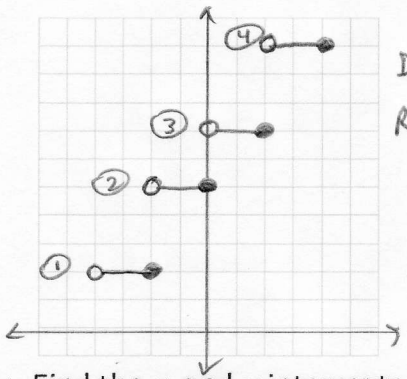


D: $\mathbb{R}$ all reals

R: $\{y \mid y < -2 \text{ or } y \geq -1\}$ set

$(-\infty, -2) \cup [-1, \infty)$ interval

13. Graph: $f(x) = \begin{cases} 2, & \text{if } -4 < x \leq -2 \ (1) \\ 5, & \text{if } -2 < x \leq 0 \ (2) \\ 7, & \text{if } 0 < x \leq 2 \ (3) \\ 10, & \text{if } 2 < x \leq 4 \ (4) \end{cases}$



interval set

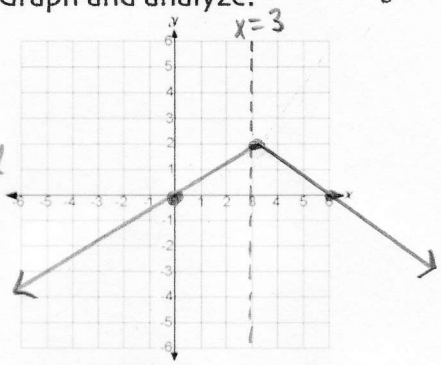
D: $(-4, 4]$ or $\{x \mid -4 < x \leq 4\}$

R: $\{2, 5, 7, 10\}$ set

$\{x \mid -4 < x \leq 4\}$ set

14. Find the x- and y-intercepts of the equation $2x - 3y + 4 = x + 2y$.

15. Graph and analyze: $f(x) = -\frac{2}{3}|x - 3| + 2$



- Opens up or down down
- Vertex (3,2)
- Axis of symmetry $x = 3$
- Domain $\mathbb{R}$
- Range $y \leq 2$
- a: X-intercept (0,0) + (6,0)
- b: Y-intercept (0,0)
- intervals of increasing/decreasing (domain)

Increase: $(-\infty, 3)$ $x < 3$

Decrease: $(3, \infty)$ $x > 3$

x: $0 = -\frac{2}{3}|x - 3| + 2$

$-2 \quad -2$

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

$\left(-\frac{3}{2}\right)\left(-\frac{2}{1}\right) = \left(-\frac{3}{2}\right)\left(-\frac{2}{3}\right)|x$

$3 = |x - 3|$

$x - 3 = 3 \quad +3 \ +3$ $\qquad$ $x - 3 = -3 \quad +3 \ +3$

$x = (6, 0)$ $\qquad$ $x = (0, 0)$

y: $y = -\frac{2}{3}|0 - 3| + 2$

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

$y = -2 + 2$

$y = 0 \quad (0, 0)$

A2H Ch2 Review 1/3

(1) $f(x) = -3|x-5|-2$; $x = 3$

$f(3) = -3|3-5|-2$ replace "x" with 3

$= -3|-2|-2$

$= -3(2)-2$

$= \boxed{-8}$ $(3, -8)$

(2) $f(x) = 2x-3$ if $x > 3$

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

$= 10-7$

$= \boxed{3}$ $(5, 3)$

find which equation has domain value $x=5$, then replace x with 5

(3) Line 1 slope: $\frac{5-10}{1-2} = \frac{-5}{-1} = \boxed{5}$

Line 2 slope: $\frac{-8-(-7)}{8-3} = \frac{-8+7}{5} = \boxed{-\frac{1}{5}}$

slopes are negative reciprocals, so perpendicular

(4) Line 1 is steeper because absolute value of $|5|$ greater than $|-\frac{1}{5}|$. Slope of 5 is steeper than $-\frac{1}{5}$, which is flatter

(5) slope intercept form shortcut, then convert to std

$y = mx + b$

$-4 = \frac{1}{3}(3) + b$

$-4 = 1 + b$

$b = -5$

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

$-\frac{1}{3}x \quad -\frac{1}{3}x$

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

$\boxed{x - 3y = 15}$

Standard form has x and y on left, constant on right, no fractions or decimals, and x-term must be positive

point slope form, then conversion to standard

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

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

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

$-\frac{1}{3}x \quad -4 \quad -\frac{1}{3}x \quad -4$

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

$\boxed{x - 3y = 15}$

Ch 2

A2H Review 2/3

(6) (9, -6) & (3, -10)

$$m = \frac{-10-(-6)}{3-9} = \frac{-10+6}{-6} = \frac{-4}{-6} = \boxed{\frac{2}{3}} \text{ slope}$$

Point slope with (9, -6)

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

$$y+6 = \frac{2}{3}(x-9)$$ point slope form

conversion to slope intercept then to standard

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

$$-6 \quad -6$$

$$y = \frac{2}{3}x - 12$$ slope intercept form

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

$$-3\left(\frac{-2}{3}x + y\right) = -12(-3)$$

$$\boxed{2x - 3y = 36}$$ standard form

(7) Parallel to $y = -\frac{1}{3}x + 2$ and through (4, -3)

(a) parallel means same slope

$$y = mx + b$$

$$-3 = -\frac{1}{3}(4) + b$$

$$-3 = -\frac{4}{3} + b$$

$$b = \frac{4}{3} - \frac{9}{3} = -\frac{5}{3}$$

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

(b) perpendicular means slopes are negative reciprocals

$$y = mx + b$$

$$-3 = 3(4) + b$$

$$-3 = 12 + b$$

$$b = -15$$

$$\boxed{y = 3x - 15}$$

42H ch 2 Review 3/3

(8) $M \geq \frac{1}{2}h$

$M \geq \frac{1}{2}(66)$

$\boxed{M \geq 33 \text{ inches}}$

$\frac{35.5}{70} = \frac{1}{2}$

(9)-(13) see review, (15) see review

(14) $2x - 3y + 4 = x + 2y$

$-x - 2y - 4 \quad -x - 2y - 4$

Standard form $x - 5y = -4$

$\boxed{x = (-4, 0)}$

$x - 5(0) = -4$

$x = -4$

for x-intercept, make y zero and solve for x

$x - 5y = -4$

$y = \boxed{0, \frac{4}{5}}$

$0 - 5y = -4$

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

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

for y-intercept, make x zero and solve for y