7.3 Linear Functions Day 2

Hi

Warm-Up Wednesday

solve for y

Write the equation of the line. Put your answer in slope-intercept form.

m= 1/3 passing through (-6, 4)

x_1, y_1

$y - 4 = \frac{1}{3}(x + 6)$

$y - 4 = \frac{1}{3}x + 2$

$+4 \quad +4$

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

About Me

1. Summer or Winter Olympics?

2. Favorite Olympic event?

Questions, comments, concerns?

7.3 Linear Functions Name _____

Determine if the function is increasing (going from left to right) or decreasing.

1. $y = 3x$

2. $y = -4x$

3. $y = -\frac{1}{2}x - 1$

4. $y = 3 - 2x$

Find the slope of the line through each pair of points.

5. (-1, 2) and (2, -6)

6. (-3, 1) and (-1, -5)

Determine the slope and y-intercept for each equation.

7. $y = 2x - 4$

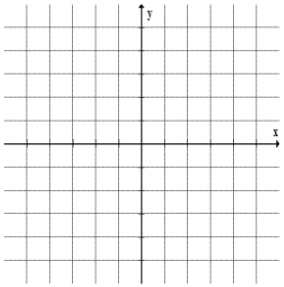
8. $2x + 3y = 2$

9. $-x + 3y + 2 = 0$

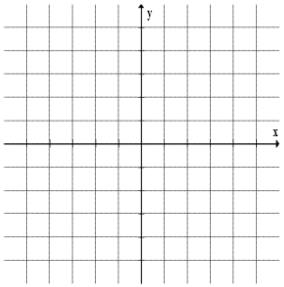
10. $-x - 3y = 8$

Draw the line that contains the given point P and has slope *m*.

11. (1, 2) and *m*=2



12. (3, -1) and *m* = undefined



Write an equation of the line passing through the given point and having slope *m*.

13. (-1, 0) and $m = \frac{2}{3}$

14. (-1, 3) and $m = 10$

15. Write an equation of the line with slope, $m = -\frac{3}{4}$, and y-intercept, $b = -3$.

Write an equation of both the vertical and horizontal line through the given point.

16. (-2, 3)

17. (0, -2)

Write an equation of the line through the given pair of points.

18. (-1, 0) and (3, 1)

$x_1 y_1 \quad x_2 y_2$

$m = \frac{1-0}{3+1} = \frac{1}{4}$

$y - 0 = \frac{1}{4}(x+1)$

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

19. (8, 1) and (8, -4)

20. (1, 1) and (0, 2)

21. (0, 300) and (10, 365)

7.3 Linear Functions Day 2

EQ: How do I find the equation of the perpendicular bisector of a line segment?

Parallel vs. Perpendicular

// slopes are the same

⊥ flippin opposites

ex. $m = 2$ $\perp m = -\frac{1}{2}$

7.3 Linear Functions Day 2

EQ: How do I find the equation of the perpendicular bisector of a line segment?

a) Find the slope of a line which is parallel (same) to the line $x-3y=21$

① Solve for y, find coefficient of x

② Standard Form $Ax+By=C$

$$\text{slope} = -\frac{A}{B}$$

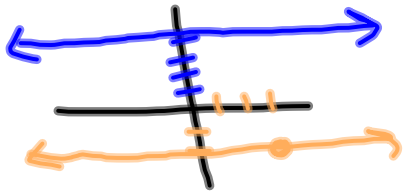
$A=1 \quad B=-3$

$$m = -\frac{1}{-3} = \boxed{\frac{1}{3}}$$

7.3 Linear Functions Day 2

EQ: How do I find the equation of the perpendicular bisector of a line segment?

a) Find the equation of the line containing $(3,-2)$ and parallel to the line $y=4$.



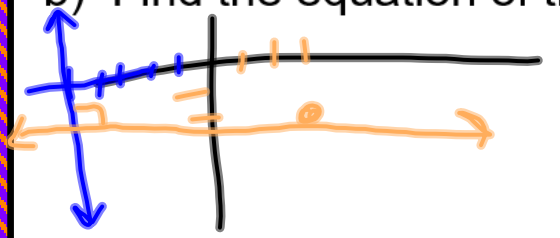
same slope

$m=0$

$y=-2$

HOY

b) Find the equation of the line containing $(3,-2)$ and ~~parallel~~ perpendicular to the line $x=-5$.



$y=-2$

VUX

7.3 Linear Functions Day 2

EQ: How do I find the equation of the perpendicular bisector of a line segment?

Find the equation of the perpendicular bisector (bisect) of the line segment joining the points $(-1,-3)$ and $(4,1)$.

$x_1\ y_1 \qquad x_2\ y_2$

1) Find slope

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$m = \frac{1+3}{4+1} = \frac{4}{5}$

2) $\perp$ slope

$\perp m = -\frac{5}{4}$ ☆

3) Find midpoint

$\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$\left(\frac{-1+4}{2}, \frac{-3+1}{2}\right) \Rightarrow \left(\frac{3}{2}, \frac{-2}{2}\right)$

$\left(\frac{3}{2}, -1\right)$ ☆

$x_1\ y_1$

4) Plug into point-slope

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

$y+1 = \frac{-5}{4}\left(x - \frac{3}{2}\right)$

7.3 Linear Functions Day 2

EQ: How do I find the equation of the perpendicular bisector of a line segment?

Evaluating Functions:

Let $f(x) = x^2 - 3x + 5$. Evaluate:

$f(1)$ "f of 1" Replace every x with (1)

$f(1) = (1)^2 - 3(1) + 5$

$= 1 - 3 + 5$

$= \boxed{3}$

$f(-2)$

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

$= 4 + 6 + 5$

$= \boxed{15}$

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

$f(x-1)$

$f(x-1) = (x-1)^2 - 3(x-1) + 5$

$= (x-1)^2 - 3x + 3 + 5$

$= (x-1)(x-1) - 3x + 8$ (FOIL)

$= x^2 - 1x - 1x + 1 - 3x + 8$

$= \boxed{x^2 - 5x + 9}$

7.3 Functions Day 2 Name _____

Write an equation for the perpendicular bisector of the line segment determined by each pair of points.

1. $(3,-5)$; $(-6,10)$

2. $(-1,3)$; $(5,-3)$

Write an equation of the line that is determined by the given conditions.

3. Contains the point $(4,-1)$ and is perpendicular to the line $2x-y=4$.

4. Contains the point $(-2,4)$ and is parallel to the line $x-4y=8$.

5. Contains the point $(-2,0)$ and is parallel to the line $x=4$.

6. Contains the point $(0,2)$ and is perpendicular to the line $y=8$.

7. Show that the triangle with vertices $(-1,2)$, $(-6,-2)$, and $(2,-12)$ is a right triangle.

10. Use the concept of slope to determine whether the three points $(-1,2)$, $(2,4)$, and $(6,9)$ are collinear, that is, whether they all lie on the same line.

In questions 11-20, use the functions $f(x)=x^2-1$ and $g(x)=\frac{1}{(x+1)}$ to find the following function values.

11. $f(0)$ 12. $f(1)$ 13. $f(3)$ 14. $f(-5)$

15. $g(0)$ 16. $g(1)$ 17. $g(3)$ 18. $g(-5)$

19. $g\left(\frac{2}{t}\right)$ 20. $f(x+2)$

7.3 Linear Functions Day 2

EQ: How do I find the equation of the perpendicular bisector of a line segment?

Exit Ticket

on google classroom