7.3 Functions Day 2 Name _____

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

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

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

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

Slope

$\frac{-3-3}{5--1} = \frac{-6}{6} = -1$

$\perp$ Slope $= 1$

Midpoint

$\frac{-1+5}{2}, \frac{3+-3}{2}$

$(2,0)$

Equation

$y-0 = 1(x-2)$

$y = x-2$

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 $2x-y=4$.

$y = -2x+7$

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

$-4y = -x+8$

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

$\parallel$ slope $\frac{1}{4}$

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

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

$y = \frac{1}{4}x+\frac{1}{2}+\frac{8}{2}$

$y = \frac{1}{4}x+\frac{9}{2}$

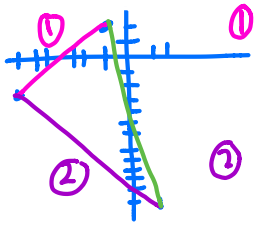
5. Contains the point $(-2,0)$ and is parallel to the line $x=4$.

$x = -2$

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

$x = 0$

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



① $\frac{-2-2}{-6-1} = \frac{-4}{-5} = \frac{4}{5}$

② $\frac{-12+2}{2+6} = \frac{-10}{8} = \frac{-5}{4}$

1 ⊥ 2

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.

1 2 3

1,2 slope $\frac{4-2}{2-1} = \frac{2}{3}$

2,3 slope $\frac{9-4}{6-2} = \frac{5}{4}$

No

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. $f(0)$ -1

12. $f(1)$ $1^2 - 1 = 0$

13. $f(3)$ 8

14. $f(-5)$ $(-5)^2 - 1 = 24$

15. $g(0)$ 1

16. $g(1)$ $\frac{1}{1+1} = \frac{1}{2}$

17. $g(3)$ $\frac{1}{4}$

18. $g(-5)$ $\frac{1}{-5+1} = -\frac{1}{4}$

19. $g\left(\frac{2}{t}\right)$

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

$\frac{t}{2+t}$

20. $f(x+2)$

$(x+2)^2 - 1$

$x^2+4x+4-1$

x^2+4x+3