Pre-Calculus/Trig3 Name Key
Part 1 Chapter 1 Review 1.1-1.5 Block ______ Date ______

Find the distance and midpoint of the following points.

1. (2, -3) & (4, 5)

$d = \sqrt{(5+3)^2 + (4-2)^2}$
$= \sqrt{64+4}$
$= \sqrt{68} = \boxed{2\sqrt{17}}$

(3, 1)

Determine if the point (-4, 5) is a solution of the following equations.

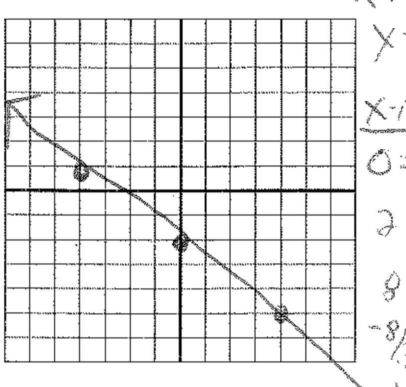
2. $y = 2(x-5)^2 + 22x - 4$

$5 = 2(-4-5)^2 + 22 \cdot -4 - 4$
$5 = 162 - 88 - 4$
$5 = 70$ $\boxed{\text{No}}$

Graph the following equations. State their x- and y- intercepts.

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

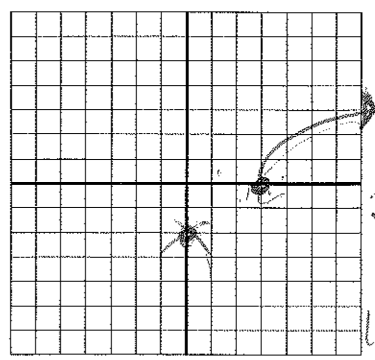
x-int: $(-8/3, 0)$
y-int: $(0, -2)$



x-int
$0 = -\frac{3}{4}x - 2$
$2 = -\frac{3}{4}x$
$8 = -3x$
$-8/3 = x$

4. $2x - 3y^2 = 6$

$3y^2 = 2x - 6$
$y^2 = \frac{2}{3}x - 2$
$y = \sqrt{2/3x - 2}$



x-int	y-int
$2x = 6$	$-3y^2 = 6$
$x = 3$	$y^2 = -2$
(3, 0)	$y = \pm\sqrt{-2}$

Identify the type(s) of symmetry the equations have. Indicate if they are even, odd, or neither.

5. $y = x^2 + 3$ $\boxed{\text{even}}$

x-axis	y-axis	origin
$-y = x^2 + 3$	$y = (-x)^2 + 3$	$-y = (-x)^2 + 3$
$y = -x^2 - 3$	$y = x^2 + 3$	$-y = x^2 + 3$
No	Yes	$y = -x^2 - 3$ No

6. $y = \sqrt{x^2 - 25}$ $\boxed{\text{even}}$

x-axis	y-axis	origin
$-y = \sqrt{x^2 - 25}$	$y = \sqrt{(-x)^2 - 25}$	$-y = \sqrt{(-x)^2 - 25}$
$y = -\sqrt{x^2 - 25}$	$y = \sqrt{x^2 - 25}$	$-y = \sqrt{x^2 - 25}$
No	Yes	No

7. $x = y^2 - 5$ – neither

x-axis	y-axis	origin
$x = (-y)^2 - 5$	$-x = y^2 - 5$	$-x = (-y)^2 - 5$
$x = y^2 - 5$	$x = -y^2 + 5$	$-x = y^2 - 5$
Yes	No	$x = -y^2 + 5$

Write the equation of the line in given the following information.

8. Through (0, -3) and (5, 2)

$m = \frac{2 - -3}{5 - 0} = \frac{5}{5} = 1$

$y = mx + b$
$-3 = 1 \cdot 0 + b$
$-3 = b$

$\boxed{y = x - 3}$

9. Parallel $y = -2x + 5$ thru (3,2)

$m = -2$ (3, 2)
$2 = 3 \cdot -2 + b$
$2 = -6 + b$
$8 = b$ $\boxed{y = -2x + 8}$

10. Perpendicular to $2x - 3y = -5$ through (-1, 4)

$3y = 2x + 5$
$y = 2/3x + 5/3$
$m = -3/2$

$4 = -3/2 \cdot -1 + b$
$4 = 3/2 + b$
$8 = 3 + 2b$
$5 = 2b$
$5/2 = b$

$\boxed{y = -3/2x + 5/2}$

11. **Determine the correct value of *k*.**

a) For what value of k is the graph of $kx - 4y = 3$ parallel to the graph of $y = -2x + 5$?

b) For what value of k are the graphs perpendicular?

State the domain and range of the following and determine if each is a function or relation.

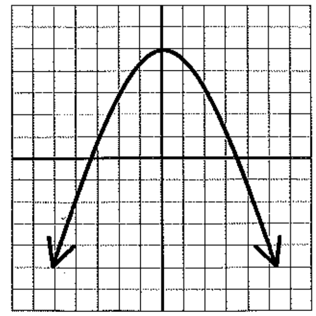
12. {(4, -5), (2, 6), (3, -5), (-4, 0)}

Domain: 4, 2, 3, -4

Range: -5, 6, -5, 0

Function? Yes

13.



Domain: $(-\infty, \infty)$

Range: $(-\infty, 5]$

Function? Yes

Pof

Inc

Dec

State the domain of the following functions.

14. $f(x) = \dfrac{x+3}{x^2-5}$

All ℝ except $\pm\sqrt{5}$

$x^2 - 5 \neq 0$

$x^2 \neq 5$

$x \neq \pm\sqrt{5}$

$(-\infty, -\sqrt{5})(-\sqrt{5}, \sqrt{5})$

$(\sqrt{5}, \infty)$

15. $f(x) = \dfrac{x^2-9}{\sqrt{x+2}}$

$x+2 > 0$

$x > -2$

All ℝ such that $x > -2$

$(-2, \infty)$

Use the functions *f(x)* and *g(x)* to answer the following questions. $f(x) = (x-1)^2 + 1, g(x) = \dfrac{x+1}{\sqrt{x}}$

16. f(-1/3) = $\left(-\frac{1}{3} - 1\right)^2 + 1$

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

$\frac{16}{9} + 1 = \boxed{\frac{25}{9}}$

17. g(-11) = $\dfrac{-11+1}{\sqrt{-11}} = \boxed{\dfrac{-10}{\sqrt{-11}}}$

$\dfrac{-10\sqrt{11}}{11i}$

18. g(1) = $\dfrac{1+1}{\sqrt{1}} = \dfrac{2}{1} = \boxed{2}$

Function Application Problems

19. In 2001, a person purchased a car for $25,290. After 11 years, the car will have to be replaced. Its value at that time is expected to be $1200. Use this information to write a linear equation that gives the dollar value of the car in terms of the year. Let t=1 represent 2001.

(1, 25290) (12, 1200) = ~~24090~~

m = -2190

25290 = -2190·1 + b

27480 = b

$\boxed{y = -2190x + 27480}$

20. The annual amount d (in billions of dollars) spent on prescription drugs in the United States from 1991 to 2002 can be approximated by the model

$$d(t)=\begin{cases} 5t+37, \_\_\_ & 1 \le t \le 7 \\ 18t-64, \_\_\_ & 8 \le t \le 12 \end{cases}$$

where t represents the year, when $t = 1$ corresponding to 1991. Use this model to find the amount spent on prescription drugs in each year from 1991 to 2002.

1993.
1998
2000

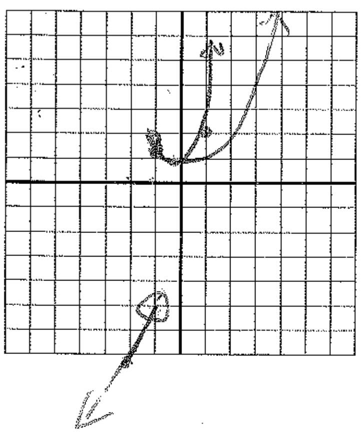
$d(3) = 5\cdot 3+37$
$15+37$
$\boxed{52}$

$d(8) = 18\cdot 8-64$
$\boxed{80}$

$d(10) = 18\cdot 10-64$
$180-64$
$\boxed{116}$

Graph the following piece-wise functions.

21. $f(x)=\begin{cases} 2x-3, x<-1 \\ x^2+1, x \ge -1 \end{cases}$



Solving algebraically find the zeros of the following functions.

22. $f(x) = 3x^2 + 7x - 6$

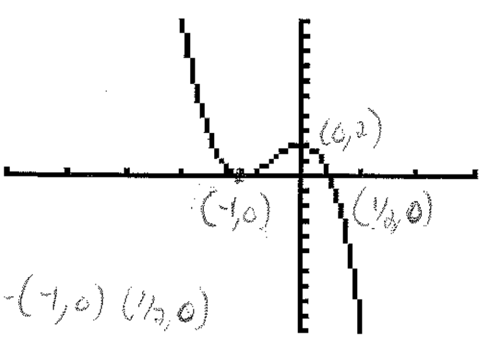
$(x+3)(3x-2)=0$
$x=-3, \frac{2}{3}$

23. $f(x)=\dfrac{\sqrt{x^2-3}}{x+1}=0$

$x^2-3=0$
$x^2=3$
$x=\pm\sqrt{3}$

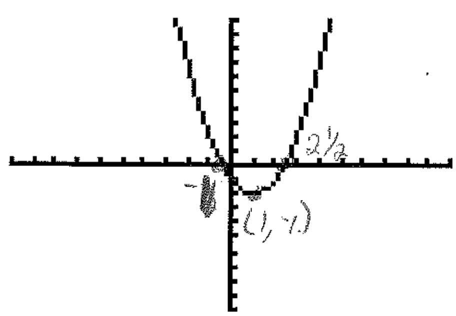
Graph the following function. Identify the zeros, relative maximum and minimum values, and the intervals where the graph is increasing, decreasing or constant.

24. $y = -2x^3 - 3x^2 + 1$



Zeros-$(-1,0)$ $(\frac{1}{2},0)$
Inc: $(-1,0)$
Dec: $(-\infty,-1)(0,\infty)$
Max $(0,2)$
Min $(-1,0)$

25. $y = (x-1)^2 - 2$



Zeros $(-\frac{1}{2},0)$ $(2\frac{1}{2},0)$
Inc: $(1,\infty)$
Dec. $(-\infty,1)$
Max-None
Min-$(1,-1)$