NAME: AK PERIOD: _____

CHAPTER 1 REVIEW PRE-CALC

1. Find the SLOPE-INTERCEPT form of the equation of the line that passes through the point (-3, 2) and has a slope of -4. $y = -4x - 10$

2. Find the STANDARD FORM of the equation of the line that passes through the point (-1, -2) and a slope of 3. $3x - y = -1$

3. Find the SLOPE-INTERCEPT form of the equation of the line through the point (2, 4) and is parallel to the line $y = 3x - 5$. $y = 3x - 2$

4. Find the STANDARD form of the equation of the line through the point (-12, 9) and has an undefined slope. $x = -12$

5. Find the GENERAL form of the equation of the line through the point (5, -7) and has zero slope. $y + 7 = 0$

6. Determine whether the lines are parallel, perpendicular, or neither. Show work and explain.

L_1: (2, 4), (-3, 5) L_2: (-3, 1), (-2, 6) ⊥, slopes are opp reciprocals

7. Does the set of ordered pairs represent y as a function of x?

a) {(-3,2), (-1,4), (-1, 6), (0, 8)} NO b) {(2,4), (3, 4), (4, 4), (5, 4)} YES

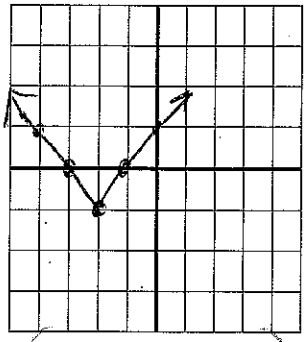
8. Determine if the equation represents a function: $2x - y^2 = 3$ No

9. What is the domain of the function?

a) $y = 3x^2 + 5x - 8$ $(-\infty, \infty)$ b) $f(x) = \sqrt{x+2}$ $[-2, \infty)$ c) $f(x) = \frac{3}{x+5}$ $(-\infty, 5) \cup (5, \infty)$

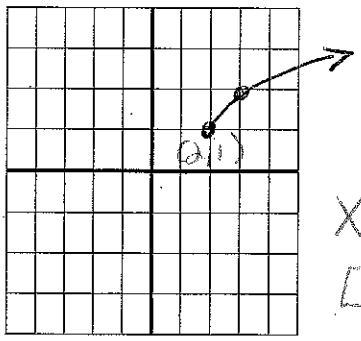
10. Find the domain of the function graphed below.

a)



$(-\infty, \infty)$

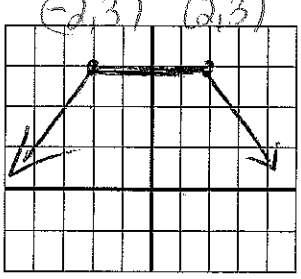
b)



$x \geq 2$

$[2, \infty)$

11. Determine the intervals on which the function is increasing, decreasing, or constant.



Inc: $(-\infty, -2)$

Constant: $(-2, 2)$

Dec: $(2, \infty)$

12. Determine whether the function is even, odd, or neither.

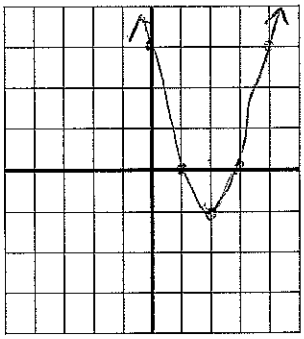
a) $f(x) = -3x^3 + x - 1$ N b) $y = 2x^2 - 3$ E c) $f(x) = 5x^3 + x$ O

13. Determine the common function and describe the transformation that occurs.

$g(x) = -\sqrt{x+7} - 3$; reflect over x,

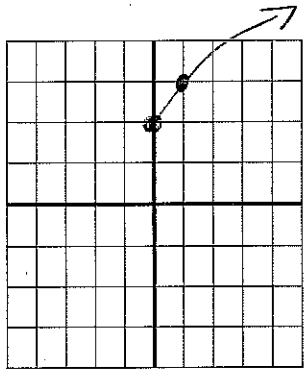
14. Find the equation for the function graphed below.

a)



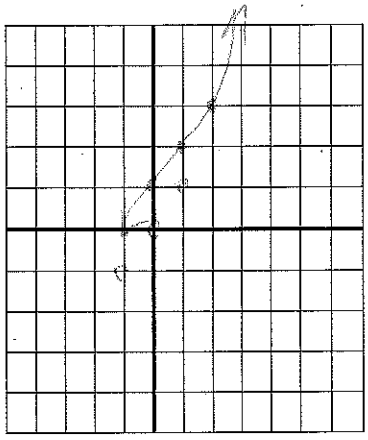
$y = (x-2)^2 - 1$

b)

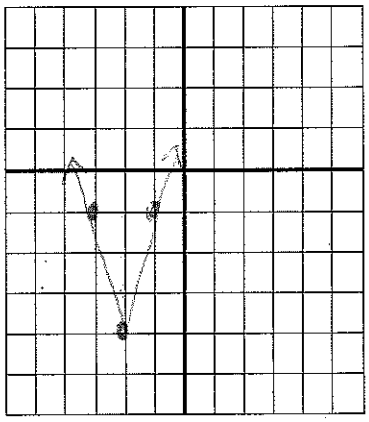


$y = \sqrt{x} + 2$

15. Graph: $y = (x-1)^3 + 2$ right 1 up 2



16. Graph: $y = 3|x+2| - 4$ left 2 down 4 V Stretch



17. If $f(x) = x^2 - 3x$ and $g(x) = x - 2$, find $(f+g)(x)$. $x^2 - 2x - 2$

18. If $f(x) = -3x^2 + 2x + 7$ and $g(x) = 3x - 2$, find $(f-g)(x)$. $-3x^2 - x + 9$

19. If $f(x) = 2x + 1$ and $g(x) = x - 1$, find $(f \circ g)(x)$ $f(x-1) = 2x - 1$

20. Find the inverse of the function $f(x) = 3x - 1$ $\frac{x+1}{3} = y$

21. Find the inverse of the function $f(x) = \frac{x^2}{3}$. $x \geq 0$ $\rightarrow \sqrt{3x} = y$

22. Find the inverse of the function $f(x) = \{(1,-5), (-5,1), (-9,8)\}$ $\rightarrow \{(-5,1), (1,-5), (8,-9)\}$

23. Verify the inverses: $f(x) = 2x^3 - 1$ $g(x) = \sqrt[3]{\frac{x+1}{2}}$ on paper

① $(\overset{x}{-3}, \overset{y}{2})$ $m=-4$ $\boxed{y=-4x-10}$

$y=mx+b$

$2=-4(-3)+b$

$2=12+b$

$-12 \quad -12$

$-10=b$

② $(\overset{x}{-1}, \overset{y}{-2})$ $m=3$ $\quad y=3x+1$

$-3x \quad -3x$

$y=mx+b$ $\quad -1(-3x+y=1)$

$-2=3(-1)+b$ $\quad \boxed{3x-y=-1}$

$-2=-3+b$

$+3 \quad +3$

$1=b$

③ $(\overset{x}{2}, \overset{y}{4})$ $m=3$ $\boxed{y=3x-2}$

$y=mx+b$

$4=3(2)+b$

$4=6+b$

$-6 \quad -6$

$-2=b$

④ slope undef $\updownarrow$ vert line $(-12, 9)$

$x=-12$

⑤ slope $=0$ $\leftrightarrow$ $(5, -7)$ $y=-7$ $\boxed{y+7=0}$

L1: (x_1, y_1), (x_2, y_2) $(2, 4)$, $(-3, 5)$ L2: (x_3, y_3), (x_4, y_4) $(-3, 1)$, $(-2, 6)$

(6) $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{5-4}{-3-2} = \frac{1}{-5}$ $m = \frac{y_4 - y_3}{x_4 - x_3} = \frac{6-1}{-2+3} = \frac{5}{1}$

$m = -\frac{1}{5}$ $m = \frac{5}{1}$

⊥ lines, slopes are opposite reciprocals

(7) a) No, because $(-1, 4) \neq (-1, 6)$
b) Yes

8) $2x - y^2 = 3$
$-y^2 = -2x + 3$
$y^2 = 2x - 3$
$y = \pm\sqrt{2x-3}$

No

9) a) $y = 3x^2 + 5x - 8$
polynomial
$(-\infty, \infty)$

b) $f(x) = \sqrt{x+2}$
$x + 2 \geq 0$
$x \geq -2$
$[-2, \infty)$

c) $f(x) = \frac{3}{x+5}$
$x + 5 = 0$
$-5 \quad -5$
$x \neq -5$
$(-\infty, -5) \cup (-5, \infty)$

12) a) Neither b) Even c) Odd

13) reflect over x, left 7, down 3

17) $(f+g)(x)$

$x^2 - 3x + x - 2$

$\boxed{x^2 - 2x - 2}$

18) $(f-g)(x)$

$-3x^2 + 2x + 7 - (3x - 2)$

$-3x^2 + 2x + 7 - 3x + 2$

$\boxed{-3x^2 - x + 9}$

19) $(f \circ g)(x)$ $\quad f(g(x)) = 2x + 1$

$f(x-1) = 2(x-1) + 1$

$= 2x - 2 + 1$

$\boxed{f(x-1) = 2x - 1}$

20) $f(x) = 3x - 1$

$y = 3x - 1$

$x = 3y - 1$

$+1 \quad +1$

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

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

or

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

21) $f(x) = \frac{x^2}{3}$

$y = \frac{x^2}{3}$

$3 \cdot x = \frac{y^2}{3} \cdot 3$

$\boxed{3x = y^2}$

$\boxed{\pm\sqrt{3x} = y}$

need to restrict domain $x \geq 0$

22) $f^{-1}(x) = \{(-5, 1), (1, -5), (6, -9)\}$

(23) $f(g(x)) = 2x^3 - 1$

$f\left(\sqrt[3]{\frac{x+1}{2}}\right) = 2\left(\sqrt[3]{\frac{x+1}{2}}\right)^3 - 1$

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

$= x + 1 - 1$

$= x$

✓

$g(f(x)) = \sqrt[3]{\frac{x+1}{2}}$

$g(2x^3 - 1) = \sqrt[3]{\frac{2x^3 - 1 + 1}{2}}$

$= \sqrt[3]{\frac{2x^3}{2}}$

$= \sqrt[3]{x^3}$

$= x$

✓