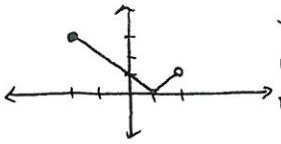
Pre-Calc **HW#1.~~5~~7-2** **Name:** Key

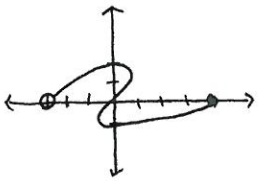
Give domain, range, and state whether each is a function:

1.



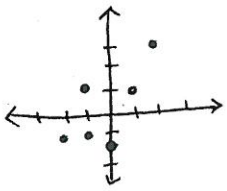
D: $[-2, 2)$
R: $[0, 3]$
Function? Yes

2.



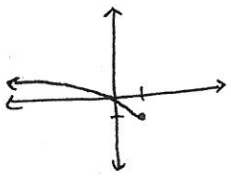
D: $(-3, 4]$
R: $[-1, 2]$
Function? No

3.



D: $\{-2, -1, 0, 1, 2\}$
R: $\{-2, -1, 1, 3\}$
Function? No

4.



D: $(-\infty, 1]$
R: $[-1, \infty)$
Function? Yes

Is y a function of x?

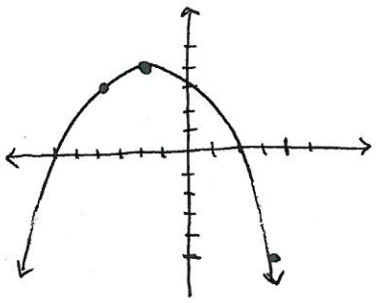
5. $x^2 + y = 5$ Yes

6. $x + y^3 = 5$
Yes

Example of not:
$y^2 = 1 + x$
$y = \pm\sqrt{1+x}$ (No)

7. Find:

domain $\mathbb{R}$
range $(-\infty, 4]$
x-intercepts $-6, 2$
y-intercepts 3
intervals increasing $(-\infty, -2)$
intervals decreasing $(-2, \infty)$
relative maxima 4
relative minima none
f(-4) 3
even, odd, or neither? neither
avg rate of change from x=-4 to x=4
$(-4, 3)$ to $(4, -5)$



$m = \frac{-5-3}{3--4} = \frac{-8}{7} = \boxed{\frac{-8}{7}}$

8. Let $f(x) = -2x^2 + x - 5$

a) is f even, odd, or neither? neither

$-2(-x)^2 + (-x) - 5$
$-2x^2 - x - 5$
same, opposite, same

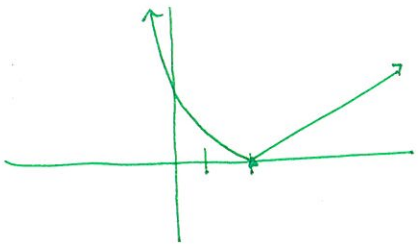
b) find $\frac{f(x+h) - f(x)}{h}, h \neq 0$

$$\frac{-2(x+h)^2 + (x+h) - 5 - (-2x^2 + x - 5)}{h}$$

$$\frac{-2x^2 - 4xh - 2h^2 + x + h - 5 + 2x^2 - x + 5}{h}$$

$$\frac{-4xh - 2h^2 + h}{h} \longrightarrow \frac{h(-4x - 2h + 1)}{h} \rightarrow \boxed{-4x - 2h + 1}$$

9. Sketch a graph that meets the following requirements:
it is a piecewise function that is decreasing on $(-\infty,2)$, f(2)=0, is increasing on $(2,\infty)$, and the range is $[0,\infty)$.



10. Suppose that $h(x)=\frac{f(x)}{g(x)}$. The function f can be even, odd ~~of~~ or neither and so can function g. Under what conditions is h definitely an even function? Under what conditions is h definitely odd?

h IS EVEN IF BOTH f and g are even OR BOTH are ODD

h IS ODD IF ONE OR THE OTHER IS ODD, BUT NOT BOTH

$\frac{(+)}{(+)}=+$ $\frac{(-)}{(-)}=+$ $\frac{(+)}{(-)}=-$ $\frac{(-)}{(+)}=-$

11. __-6__x + __3__y = 12. Fill in the blanks so that the x-intercept is –2 and the y-intercept is 4.

(-2,0) (0,4) → m = 2

y = 2x+4

(-2x + y = 4) 3 → $\boxed{-6x+3y=12}$

12. __1__x + __-2__y = 12. Fill in the blanks so that the y-intercept is –6 and the slope is 0.5.

$y=\frac{1}{2}x-6$

$2y=x-12$

$\boxed{12=x-2y}$

13. Determine the value of A so that the line whose equation is Ax + y – 2 = 0 is perpendicular to the line containing the points (1,-3) and (-2,4).

$m=-\frac{7}{3}$

$\perp$ TO $m=\frac{3}{7}$

$Ax+y-2=0$

$y=\boxed{-Ax}+2$

$-A=\frac{3}{7}$

SO $\boxed{A=-\frac{3}{7}}$