HW 2.1-2.2 Name Key

1. Determine which are Polynomial Functions. For those that are, state the degree and leading coefficient.

a) $f(x) = 2x^2 - 4x - 1$

yes degree = 2
LC = 2

b) $g(x) = 3x^{-2} + 5x^{-1} - 4$

NO b/c negative exponent

2. Use the Point-Slope Equation to write an equation for the linear function f satisfying the given conditions. Then rewrite the function in slope-intercept form and standard form.

$f(-3) = 5 \quad f(2) = -6$

$m = \frac{5-(-6)}{-3-2} = \frac{11}{-5}$

$y = 5 - \frac{11}{5}(x+3)$

OR

$y = -6 - \frac{11}{5}(x-2)$

$y = 5 - \frac{11}{5}x - \frac{33}{5}$

$y = -\frac{11}{5}x - \frac{8}{5}$

$y = -6 - \frac{11}{5}x + \frac{22}{5}$

$(5)y = -\frac{11x}{5}(5) - \frac{28}{5}(5)$

$5y = -11x - 28$

$11x + 5y = -28$

3. Find the vertex and axis of symmetry of the graph of the function using $x = \frac{-b}{2a}$. Then rewrite the equation in vertex form. Then use vertex form to find the x-intercepts.

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

$x = \frac{-(-8)}{2(2)} = 2$

$y = 2(2)^2 - 8(2) + 5$

$y = 8 - 16 + 5$

$y = -3$

$y = 2(x-2)^2 - 3$

$0 = 2(x-2)^2 - 3$

$3 = 2(x-2)^2$

$\sqrt{1.5} = \sqrt{(x-2)^2}$

~~No x int~~

$2 \pm \sqrt{\frac{3}{2}}$

4. Use Completing the square to describe the graph each function. Then use the quadratic formula to find the x-intercepts

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

$y - 5 = 2x^2 - 8x$

$\frac{y}{2} - \frac{5}{2} = x^2 - 4x$

$\frac{y}{2} - \frac{5}{2} + 4 = (x-2)^2$

$\frac{y}{2} + \frac{3}{2} = (x-2)^2$

$y + 3 = 2(x-2)^2$

~~$y+3=7$~~

$y = 2(x-2)^2 - 3$

$x = \frac{8 \pm \sqrt{64 - 40}}{4}$

$x = 2 \pm \frac{\sqrt{24}}{4}$

5. Write an equation for the quadratic function whose graph contains the given vertex and point

Vertex (-5, 2) and point (4, 12)

$y = \frac{10}{81}(x+5)^2$

6. Let $f(x) = 2x^2 - 1$

a) Compute the average rate of change of f(x) from x = 1 to x =4

(1,1) (4,31) $\frac{30}{3} = 10$

b. Compute the average rate of change of f(x) from x = 1 to x = b

(1,1) $(b, 2b^2-1)$

$\frac{2b^2-1-1}{b-1} = \frac{2b^2-2}{b-1}$ $\frac{2(b^2-1)}{b-1}$ $\frac{2(b+1)(b-1)}{b-1}$

$2(b+1)$

7. Rewrite the following with a positive exponent then in root form

$\frac{5}{x^{-4/3}}$ = $5x^{4/3}$

8. Rewrite the following variable with a negative exponent (positive)

$10x^{-6}$ = $10/x^6$

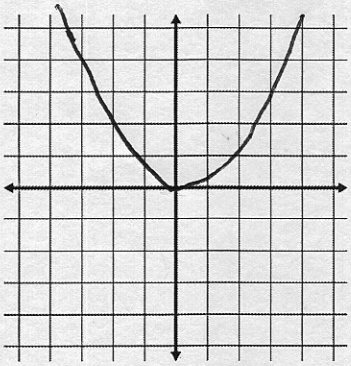
9. Determine whether the function is a power function. For those that are power functions, state the power and constant of variation. Also, determine which are monomial functions. For the functions that are monomials, give the degree and leading coefficient.

a. $\frac{5}{x^{-4/3}}$ PwF = yes → Con 5 → power 4/3 b. $4(2)^x$ neither

Mon = No

Sketch a graph of the following functions

$y = x^{4/3}$ = $\sqrt[3]{x^4}$



1) Determine the domain and range

D: $(-\infty,\infty)$ R: $[0,\infty)$

2) Is the function even, odd or undefined for x < 0

even

3) Intervals of Increase or Decrease

dec $(-\infty,0)$ Inc $(0,\infty)$

4) Find any extrema.

$(0,0)$
min

5) Determine the end behavior

$\lim f(x) = \infty$
$x \to \pm\infty$

6) Find any asymptotes

None

7) Intervals of Concavity

up $(-\infty,\infty)$

~~down $(0,\infty)$~~

OR

Up $(-\infty,\infty)$