ALGEBRA 2 CHAPTER 3 REVIEW: **NAME:** KEY

1. Consider the sequence 48, 24, ...

a. Assuming that the sequence is arithmetic with t(1) as the first term, find the next two terms of the sequence and then write an equation for t(n) 0, -24 $t(n) = -24n + 72$

b. Assuming that the sequence is geometric with t(1) as the first term, find the next two terms of the sequence and then write an equation for t(n). 12, 6 $t(n) = 48\left(\frac{1}{2}\right)^{n-1}$

2. Write the equation of the circle in graphing form with a radius of 11 and a center of (-6,7)

$(x+6)^2 + (y-7)^2 = 121$

3. Put the following quadratic equation in the vertex/graphing form. Identify the vertex:

$y = x^2 - 12x - 15$ $y = (x-6)^2 - 15 - 36$ $y = (x-6)^2 - 51$

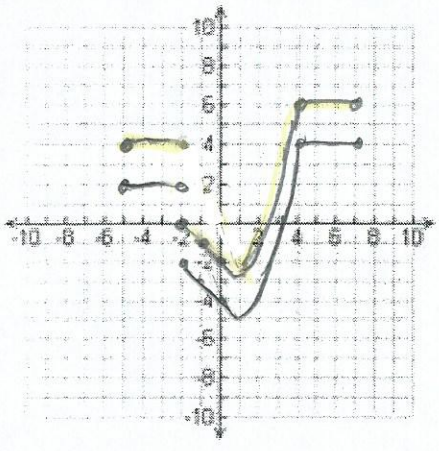
4. Solve the inequality: $-5x \leq 10 - 2x$ $-3x \leq 10$ $x \geq -10/3$

5. Rewrite and or simplify the following expressions:

a. $\frac{1}{\sqrt{x}}$ $\frac{1}{x^{1/2}}$ b. $(m^2)^{-3/2}$ $m^{-3} = \frac{1}{m^3}$ c. $(9x^3y^6)^{-2}$ $\frac{1}{81x^6y^{12}}$

6. Graph the following piecewise function and then translate f(x) + 2 using a different color.7.

$$f(x) = \begin{cases} y = 2, & -5 \leq x < -2 \\ y = 4 - x, & -2 \leq x < 1 \\ y = (x-1)^2 - 5, & +1 \leq x \leq 4 \\ y = 4, & 4 \leq x \leq 7 \end{cases}$$



7. If $g(x) = -2x^2$ and $h(x) = 5x + 3$, find:

a. $g(4)$ $g(4) = -2(16) = -32$ (a)
b. $h(g(-2))$ $h(-8) = -40+3 = -37$ (b)
c. *find x if h(x) =0* $0 = 5x+3 \quad x = -3/5$ (c)

8. Solve each equation after first rewriting it in a simpler equivalent form.

a. $3(2x - 1) + 12 = 4x - 3$ $6x-3+12 = 4x-3$ $6x+9 = 4x-3$ $2x = -12$ $x = -6$ $x=-6$

b. $\left(\frac{3x}{7} + \frac{2}{7} = 2\right)7$ $3x+2 = 14$ $3x = 12$ $x=4$

c. $\left(\frac{3}{4}x^2 = \frac{5}{4}x + \frac{1}{2}\right)4$ $3x^2 = 5x+2$ $3x^2-5x-2=0$ $3x^2-6x+1x-2=0$ $3x(x-2)+1(x-2)=0$ $(3x+1)(x-2)=0$ $x=2$, $x=-1/3$ $AC = -6$: $-6, 1$

d. $4x(x - 2) = (2x + 1)(2x - 3)$ $4x^2-8x = 4x^2-6x+2x-3$ $-8x = -4x-3$ $-4x = -3$ $x = 3/4$

9. Which of the following pairs of equations or expressions are equivalent? Justify your reasoning either by using algebra to transform the first equation or expression into the second or by demonstrating with a counterexample.

a. $n(2n + 1)(2n - 1)$; $4n^2 - n$ $n(4n^2-1) = 4n^3-n \neq 4n^2-n$ NO

b. $(2x - 1)^2$; $4x^2 - 1$ $4x^2-4x+1 \neq 4x^2-1$ NO

c. $10x^2 - 55x - 105$; $5(2x + 3)(x - 7)$ YES $5(2x^2-14x+3x-21) = 10x^2-55x+105$ ✓

d. $\left(\frac{4x^{12}}{-2x^8}\right)^3$; $-8x^{12}$ $\frac{64x^{36}}{-8x^{24}} = -8x^{12}$ ✓ YES

e. $2x - 3y = 6$; $y = \frac{2}{3}x + 6$ $-3y = -2x+6$, -3 $y = 2/3x - 2 \neq \frac{2}{3}x + 6$ NO

f. $\sqrt{108}$; $6\sqrt{3}$ $108 = 9 \cdot 12$, $12 = 4 \cdot 3$ $3 \cdot 2\sqrt{3} = 6\sqrt{3}$ ✓ YES

10. Evan spent the summer earning money so he could buy the classic car of his dreams. He purchased the car for $2295 from Fast Deal Freddie, the local used car salesman. Freddie told Evan that the car would increase by half its value after five years. Evan knows that this model appreciates 8% annually. Did Freddie try to trick Evan, or was his claim accurate?

Tried to trick

$2295 \cdot 1.5 = \$3442$

$y = 2295(1.08)^5 = \$3372.11$ actual

$3442 \neq 3372$

11. Decide whether each function below is even, odd or neither, and explain your reasoning.

a. $y = x^3 + x$ Odd rotates 180° about the origin

b. $y = x^2 + x$ Neither – vertex is not at the origin

c. $y = x^4 + x^2$ Even, reflects across y-axis and vertex @ origin