NAME: _____ PERIOD: _____ DATE: _____

Homework Problem Set

1. Factor completely: $15x^2 - 40x - 15$.

GCF: 5

$5(3x^2 - 8x - 3)$

	$3x$	1
x	$3x^2$	x
-3	$-9x$	-3

$5(3x+1)(x-3)$

OR

$5(3x^2 - 8x - 3)$

-9 and 1 multiply to -9 and add to -8

$5(3x^2 - 9x + 1x - 3)$

$5(3x(x-3) + 1(x-3))$

$5(3x+1)(x-3)$

Solve each equation.

2. $4x^2 = 9$

$\frac{4}{4} \quad \frac{4}{4}$

$\sqrt{x^2} = \pm\sqrt{\frac{9}{4}}$

$x = \pm\frac{3}{2}$

3. $3y^2 - 8 = 13$

$3y^2 = 21$

$\sqrt{y^2} = \pm\sqrt{7}$

$y = \pm\sqrt{7}$

4. $\sqrt{(d+4)^2} = \pm\sqrt{5}$

$d + 4 = \pm\sqrt{5}$

$d = -4 \pm \sqrt{5}$

5. $4(g-1)^2 + 6 = 13$

$4(g-1)^2 = 7$

$\sqrt{(g-1)^2} = \pm\sqrt{\frac{7}{4}}$

$g - 1 = \pm\sqrt{\frac{7}{4}}$

$\sqrt{\frac{7}{4}} = \frac{\sqrt{7}}{\sqrt{4}} = \frac{\sqrt{7}}{2}$

$g = 1 \pm \sqrt{\frac{7}{4}} \rightarrow g = 1 \pm \frac{\sqrt{7}}{2}$

6. $12 = -2(5-k)^2 + 20$

$-8 = -2(5-k)^2$

$\pm\sqrt{4} = \sqrt{(5-k)^2}$

$\pm 2 = 5 - k$

$2 = 5 - k \qquad -2 = 5 - k$

$k = 3$ or 7

7. $-5x^2 = -500$

$\sqrt{x^2} = \pm\sqrt{100}$

$x = \pm 10$

8. $7n^2 + 448 = 0$

$7n^2 = -448$

$\sqrt{n^2} = \sqrt{-64}$ ← can't take $\sqrt{}$ of negative #

NO SOLUTION

9. $m^2 + 7 = 88$

$\sqrt{m^2} = \pm\sqrt{81}$

$m = \pm 9$

10. $\frac{x^2}{25} - 6 = -2$

$\frac{x^2}{25} = 4$

$\sqrt{x^2} = \pm\sqrt{100}$

$x = \pm 10$

11. $4(x^2 - 15) = 84$

$x^2 - 15 = 21$

$\sqrt{x^2} = \pm\sqrt{36}$

$x = \pm 6$

12. $2(x-1)^2 = 8$

$\sqrt{(x-1)^2} = \pm\sqrt{4}$

$x - 1 = \pm 2$

$x - 1 = 2 \quad x - 1 = -2$

$x = 3$ or -1

13. $(x+2)^2 - 6 = 30$

$\sqrt{(x+2)^2} = \pm\sqrt{36}$

$x + 2 = \pm 6$

$x + 2 = 6 \quad x + 2 = -6$

$x = 4$ or -8

14. $(3x+6)^2 - 81 = 0$

$\sqrt{(3x+6)^2} = \pm\sqrt{81}$

$3x + 6 = \pm 9$

$3x + 6 = 9 \quad 3x + 6 = -9$

$x = 1$ or -5

15. $\sqrt{(4x-5)^2} = \pm\sqrt{64}$

$4x - 5 = \pm 8$

$4x - 5 = 8 \quad 4x - 5 = -8$

$x = \frac{13}{4}$ or $-\frac{3}{4}$

16. Mischief is an Alaskan malamute dog that competes with her trainer in the agility course. Within the course, Mischief must leap through a hoop. Mischief's jump can be modeled by the equation $h = -16t^2 + 12t$, where h is the height of the leap in feet and t is the time since the leap, in seconds. At what values of t does Mischief start and end the jump?

Need to find where height h, is zero and solve

$-16t^2 + 12t = 0$

$-4t(4t-3) = 0$

$t = 0$ or $\frac{3}{4}$ seconds

Leap starts at 0 and ends at $\frac{3}{4}$ seconds

17. A string 60 inches long is to be laid out on a tabletop to make a rectangle of perimeter 60 inches. Write the width of the rectangle as $15 + x$ inches. What is an expression for its length? What is an expression for its area? What value for x gives an area of the largest possible value? Describe the shape of the rectangle for this special value of x.

Length: $15-x$ Area $(15-x)(15+x)$

Largest area is when $x=0$

rectangle is a square w/ side length of 15 in.