

## 102 Test review Problems

**Inequalities**

1. Solve the inequality for x:  $3x - 6 \geq \frac{1}{2}x + 2$
  
2. Solve the inequality for x:  $-x - 16 \leq -\frac{3}{4}x + 12$

**Simplification of exponents and writing the answer using positive exponents only:**

1. Simplify  $\frac{z^2}{z^{-7}}$
  
2. Simplify:  $p^2q^{-1}(3p^3q^4s^{-4})^2$
  
3. Simplify:

$$\left(x^{-4}z^4\right)\left(\frac{2x^2}{z^{-1}}\right)^{-3}$$

**Simplification of radicals**

1. Simplify:

$$\frac{\sqrt{81}}{\sqrt{25}}$$

2. Simplify

$$\frac{\sqrt{121}}{\sqrt{36}}$$

**Factoring problems:**

1.  $27-125w^3$

2.  $8x^3 + 64$

3.  $16-y^4$

4.  $x^2-4a^2$

5.  $10x^2 - 6xy - 28y^2$

6.  $3x^2-5x-2$

7.  $4x^2 -12x -7$

**Solve for the unknown indicated in each case:**

1.  $(u-1)^2 - 8 = 0$  where  $u$  is a real number

2.  $(x+4)^2 - 12 = 0$  where  $x$  is a real number

3. Solve:  $3x^2 = 10x - 3$

4. Solve:  $y^4 - 5y^2 = -4$

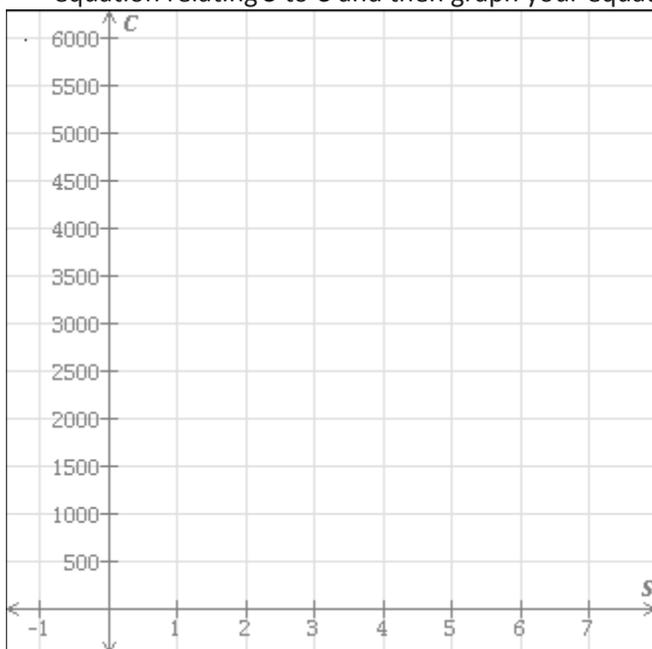
### **Parabolas**

1. Find the x-intercept(s) and the coordinates of the vertex for the parabola  $x^2 + 8x + 15$

2. Graph the parabola  $y = (x-3)^2 + 1$



3. The length of a rectangle is 2 feet more than twice its width. Its area is  $40 \text{ ft}^2$ . What are its dimensions?
4. A total of \$15,000 is invested between two funds A and B. Fund A pays 5% interest per year and Fund B pays 7% interest per year. If the annual interest from both funds is \$ 850, how much money was invested in each fund?
5. The Sugar Sweet Company is going to transport its sugar to market. It will cost \$4000 to rent trucks, and it will cost an additional \$200 for each ton of sugar transported. Let  $C$  represent the total cost (in dollars), and let  $S$  represent the amount of sugar (in tons) transported. Write an equation relating  $S$  to  $C$  and then graph your equation using the axes below.



**Formulas you want to memorize:**

Quadratic formula:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Vertex of a parabola  $x = \frac{-b}{2a}$

Factoring of perfect cubes:

$$a^3 + b^3 = (a + b)(a^2 - ab + b^2)$$

$$a^3 - b^3 = (a - b)(a^2 + ab + b^2)$$

Factoring of perfect squares:

$$a^2 - b^2 = (a - b)(a + b)$$

Equation of a straight line in slope-intercept form

$$y = mx + b$$