Math 102, Ch. 5 Practice Test

Note: No make-up exams will be allowed. Instead, the lowest score will be dropped.

1. Solve using the square root property.

(a) $x^2 = 81$

(b) $5x^2 = -5$

2. Solve using the square root property.

(a) $(x - 2)^2 = 36$

(b) $(x - 2)^2 = -36$

3. Solve using the square root property. Write the solutions in simplified radical form.

$(5x + 10)^2 = 50$

Solution set:

4. Solve by completing the square. Write the solutions in simplified radical form. *Some outlining of the beginning steps has been done for you.*

$x^2 + 10x = 3$

$x^2 + 10x + \square = 3 + \square$

$(x + \square)^2 = \square$

Solution set:

5. Solve by completing the square. Write the solutions in simplified radical form.

$x^2 + 6x - 1 = 0$

Solution set:

6. Solve by completing the square. Write the solutions in simplified $a + bi$ form.

$x^2 - 4x + 28 = 0$

Solution set:

7. Solve by using the quadratic formula. Write the solutions as fractions.

$8x^2 + 8x - 6 = 0$

Solution set:

8. Solve by using the quadratic formula. Write the solutions in simplified $a + bi$ form.

$6x^2 = 4x - 1$

Solution set:

9. Solve by using the quadratic formula. Write the solutions in $a + bi$ form.

$$2x^2 - 2x = -5$$

Solution set:

10. Using the discriminant only, determine the number and type of solutions to

(a) $x^2 - 4x - 32 = 0$

(b) $x^2 + 4x + 1 = 0$

11. Solve. Write the solution set in interval notation.

$$(3x - 5)(x + 2) > 0$$

Interval notation:

12. Solve. Write the solution set in interval notation.

$$x^2 + 15x + 50 \leq 0$$

Interval notation:

13. Solve. Write the solution set in interval notation.

$$\frac{3}{x} > 6$$

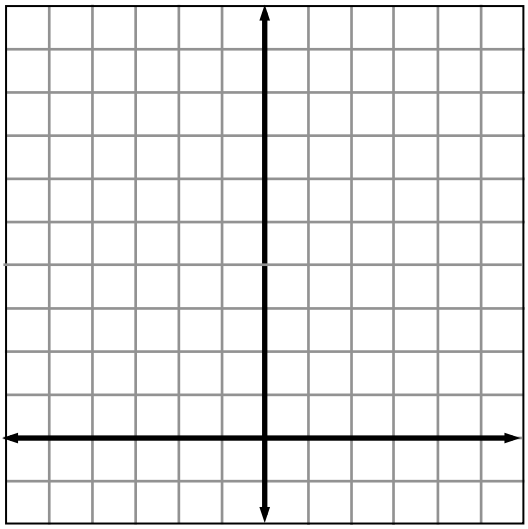
Interval notation:

14. Determine the vertex, the axis of symmetry, and the graph of the equation

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

vertex:

axis:

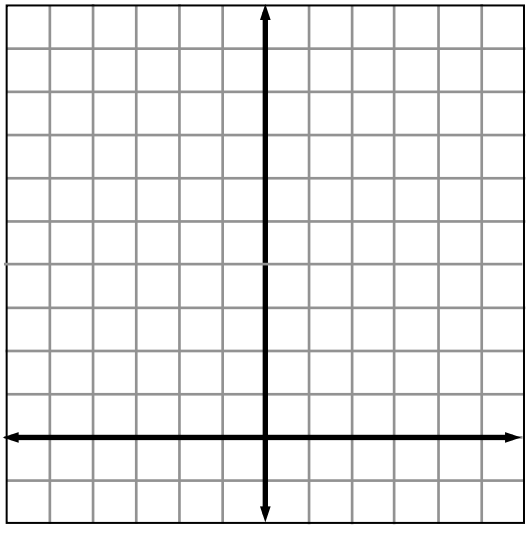


15. Determine the vertex, the axis of symmetry, and the graph of the equation

$$y = -2(x - 2)^2 + 9$$

vertex:

axis:



16. Determine the vertex of the parabola

$$y = x^2 + 10x + 15$$

Vertex:

17. Determine the x-intercepts of the parabola.

$$y = x^2 - 3x - 40$$

x-intercepts:

18. Determine the x-intercepts of the parabola. Write your answers to the nearest tenth.

$$y = x^2 + 7x + 2$$

x-intercepts:

19. A rectangle has an area of 112 square inches. If the width is 10 inches less than 3 times the length, find the width and length of the rectangle.

Length	
Width	

Area = Length × Width

Length:

Width:

20. A hiker travels 10 miles, walking at a constant speed. He walks the next 5 miles at a speed that is 3 miles per hour faster. The total time of the hike is 6 hours. What was the hiker's speed for each part of the hike? Write your answers to the nearest tenth.

	Rate	Time	Distance
First part			
Second part			

First part:

Second part:

For Reference

Square Root Property	
Let x and k be any two complex numbers.	If $x^2 = k$, then $x = \sqrt{k}$ or $x = -\sqrt{k}$. (We will use the notation $x = \pm\sqrt{k}$ to represent $x = \sqrt{k}$ or $x = -\sqrt{k}$.)

Discriminant ($b^2 - 4ac$)	**Number and Type of Solutions**
Positive and the square of an integer	Two rational solutions
Positive, but not the square of an integer	Two irrational solutions
Zero	One rational solution
Negative	Two nonreal complex solutions

General Principles of the Vertical Parabola	
$y = a(x - h)^2 + k$, $a \neq 0$	
Vertex	(h, k)
Axis of symmetry	$x = h$
Opens up	$a > 0$
Opens down	$a < 0$
Wider than $y = x^2$	$0 < \lvert a \rvert < 1$
Narrower than $y = x^2$	$\lvert a \rvert > 1$