New York City College of Technology

MAT 1275/D529 - Spring 2017

Review for Exam 2

NAME: _____

Instructions: The exam questions are closely related to the homework and to the examples shown in class. **Make sure you review all problems in the following WeBWorK assignments: Square Root Property, Quadratic Formula, Shifting Parabolas, Parabola Vertices-Vertex Formula, Distance Formula, Circles, 3×3 Systems.**

You will have several short questions to test your basic knowledge.

1. Fill in the missing value so that the expression $x^2 - 11x + -$ is a perfect square trinomial. Then write the perfect square trinomial in factored form.
2. Solve $x^2 = 27$.
3. Find the vertex of the parabola $y = (x - 8)^2$.
4. Find the vertex of the parabola $y = x^2 - 8$.
5. Find the center and the radius of the circle $x^2 + y^2 = 21$.
6. Find the distance between the points $(3, -4)$ and $(1, 10)$. If your answer has a radical, don't forget to write it in simplest radical form.

Most of the problems require several steps and you need to show all your work.

1. Solve a quadratic equation. (You can choose the method.)
   (a) Solve the equation $x^2 - 4x = -26$.
   (b) Solve the equation $(x + 7)^2 = 72$.
2. Solve a system of linear equations in 3 variables.
$$\begin{pmatrix} x - 2y + z & = & -4 \\ 2x + 4y - 3z & = & -1 \\ -3x - 6y + 7z & = & 4 \end{pmatrix}$$
3. Given the parabola $y = 2x^2 - 10x + 3$

   a) Find the vertex;

   b) Graph the parabola (give the coordinates of at least one point on each side of the vertex). Clearly label the vertex and the points you chose on your graph;

   c) Find the x-intercepts and the y-intercept and label them on your graph. Make sure you give exact answers.
4. Write the equation of the circle $x^2 + y^2 + 4x - 8y + 16 = 0$ in standard form. Find the center and radius of the circle. Graph the circle. Find the coordinates of 4 points on the circle and label them on your graph.
5. Write an equation of a circle that has the points $(-2, 3)$ and $(2, 3)$ as endpoints.

Answers

The answers to short questions will be discussed in class. Graphs will also be discussed in class. 1(a) $2 \pm i\sqrt{22}$; 1(b) $-7 \pm 6\sqrt{2}$; 2) $(-2, 3/2, 1)$; 3) vertex is $(5/2, -19/2)$, y-intercept is $(0, 3)$, x-intercepts are $(\frac{5-\sqrt{19}}{2}, 0), (\frac{5+\sqrt{19}}{2}, 0)$; 4) standard form $(x+2)^2 + (y-4)^2 = 4$, center $(-2, 4)$, radius 2; 5) $x^2 + (y-3)^2 = 4$.