

Exam 3 Review

MAT 1275CO Spring 2022

Part I. Solving Quadratic Equations.

1. Solve the following quadratic equations by using the square root property.

(a) $(x + 8)^2 = 17$

(b) $(x - \frac{1}{2})^2 = \frac{3}{16}$

2. Solve the following quadratic equations by completing the square.

(a) $x^2 - 2x = 24$

(b) $x^2 + 8x + 41 = 0$

3. Solve the following quadratic equations by using the quadratic formula.

(a) $x^2 - 12x + 40 = 0$

(b) $9x^2 - 48x + 113 = 0$

Part II. Applications of Quadratic Equations.

1. The area of a rectangle is 60 square cm and the perimeter is 34 cm. Find the length and width of the rectangle.
2. Suppose that the length of one leg of a right triangle is 3 inches more than the length of the other leg. If the length of the hypotenuse is 15 inches, find the lengths of the two legs.
3. A right triangle has side lengths represented by three consecutive even integers. Find the lengths of the three sides, measured in meters.

Part III. Graphs of Quadratic Functions.

1. Graph these equations. Label the coordinates of the vertex and x and y-intercepts (where appropriate), and write the equation of the axis of symmetry.

(a) $y = x^2 + 4x + 5$

(b) $y = \frac{1}{3}x^2 + 5$

(c) $y = (x + 5)^2 - 2$

(d) $y = -2x^2 + 8x + 9$

(e) $y = x^2 + 4x$

Part IV. Distance Formula, Midpoint and Circles

1. Find the radius of a circle with endpoints of a diameter $(-2, 3)$ and $(4, 1)$
2. Identify the center and radius of the circle and then graph the circle. Complete the square if necessary.

(a) $(x - 3)^2 + (y + 1)^2 = 16$

(b) $(x + 1)^2 + y^2 = 1$

(c) $x^2 + y^2 + 4x - 8y + 16 = 0$

(d) $x^2 + y^2 + 10x + 6y + 18 = 0$

Part V. Systems of Equations.

Solve these systems of equations.

1.

$$x^2 + xy = 7$$

$$x + 2y = 5$$

2.

$$x^2 + y^2 = 5$$

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

3.

$$3x^2 + 4y^2 = 16$$

$$2x^2 - 3y^2 = 5$$