

Review for Exam 1

1 A Bit of Review

1.1 Order of Operations

1.1.1 Example

Simplify the expression $-4^2 + 5 - 4 \cdot 3$.

1.1.2 Example

List the order in which operations are being applied to b .

$$b^3 - 2a$$

1.2 Square Roots and Principal Square Roots

1.2.1 Example

Simplify.

(a) $\sqrt{16} + 5$

(b) $\sqrt{27}\sqrt{3}$

1.3 Negation

1.3.1 Example

Which of the following is positive?

(a) $e - 3$

(b) $e^2 - 6$

2 Solving Equations

2.1 Distance on the Number Line: Absolute Value

2.1.1 Example

Find the value.

(a) $|-e|$

(b) $|2 - e^2|$

2.2 Solving Equations with One Variable Type

2.2.1 Example

Verify that $x = 4$ is a solution to $2x - 7 = 5(1 - x) + 4x$.

2.2.2 Example

Solve for s .

$$3\left(\frac{2-s}{8}\right) = \frac{s+6}{12}$$

2.2.3 Example

Solve for r .

$$V = \frac{4}{3}\pi r^3$$

2.2.4 Example

Solve for x .

$$\frac{x}{x-1} = \frac{2}{x^2+x}$$

(*Hint:* Remember to check for extraneous solutions)

2.2.5 Example

Solve for x , $|3x+1| = 5$.

2.2.6 Example

Solve the following quadratic equation $x^2 + 5x = 7$.

2.2.7 Example

Solve for t .

$$\frac{1}{(t+1)^2} - 3 = \frac{2}{t+1}$$

2.2.8 Example

Find all real solutions to the equation.

$$6x^3 + x^2 = 6x + 1$$

2.2.9 Example

Find all real solutions to the equation.

$$3 + \sqrt{x} = x$$

3 The Cartesian Coordinate System

3.1 Graphs of Equations with Two Variables

3.1.1 Example

Is $(5, 4)$ on the graph of $y = 6x - 8$?

3.1.2 Example

Find the x -intercept and y -intercept of the graph $x = y^2 - 5y - 6$.

3.2 Distance

3.2.1 Example

Use the Pythagorean Theorem to find the distance between the point $(1, -6)$ and $(4, 1)$.

3.3 Equations of Circles

3.3.1 Example

Find an equation for the circle with center $(1, -5)$ and radius 3.

3.3.2 Example

Is the graph of $x^2 + y^2 - 6x + 2y = -9$ a circle? If so, find its center and radius.

3.4 Midpoints

3.4.1 Example

Find the midpoint of the line segment from $(1, -7)$ to $(6, -1)$.

3.5 Steepness, Lines, and Rates of Change

3.5.1 Example

Find the slope of the line that passes through $(-4, 2)$ and $(2, -1)$.

3.5.2 Example

Find an equation for the line that passes through the point $(5, -3)$ and has a slope $\frac{3}{2}$.

3.5.3 Example

Find an equation for the line that passes through the point $(5, 2)$ and is parallel to the line whose equation is $y - 3 = \frac{7}{4}(x - 7)$.

4 Systems of Equations

4.1 Solutions to Systems of Equations

4.1.1 Example

Find a solution to the following system of equations.

$$3x - 2y = 2$$

$$5x + y = 4$$

4.1.2 Example

Find a solution to the following system of equations.

$$x^3 + 4y^2 = 12$$

$$x + y^2 = 3$$

4.1.3 Example

Find the points of intersection between the graphs of $3x - y = 5$ and $(x - 1)^2 + y^2 = 16$.