Calculus 1 Workbook

Other functions and trigonometry

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MATH

QUADRATIC FORMULA

1. Solve for x using the quadratic formula.

$$4x^2 - 8x - 15 = 0$$

2. Write the quadratic formula for the following quadratic equation.

$$x^2 - 5x - 24 = 0$$

3. What went wrong in the way the quadratic formula was applied?

$$3x^2 - 5x + 10 = 0$$

$$x = \frac{-5 \pm \sqrt{(-5)^2 - 4(3)(10)}}{2(3)}$$

4. Solve for z using the quadratic formula.

$$z^2 = z + 3$$

5. Fill in the blank with the correct term if the quadratic formula below was built from the quadratic equation.

$$\_\_\_\_x^2 + 3x - 5 = 0$$

$$x = \frac{-3 \pm \sqrt{(3)^2 - 4(-2)(-5)}}{2(-2)}$$

6. Simplify the expression.

$$\frac{-(-8) \pm \sqrt{(-8)^2 - 4(1)(14)}}{2(1)}$$

7. What are two ways to solve a quadratic equation when you cannot easily factor?

8. What went wrong if the quadratic formula below was built from the quadratic equation?

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

$$x = \frac{-2 \pm \sqrt{(2)^2 - 4(1)(7)}}{2(1)}$$

9. Solve for t using the quadratic formula.

$$4t^2 - 1 = -8t$$

COMPLETING THE SQUARE

1. Solve for x by completing the square.

$$x^2 - 6x + 5 = 0$$

2. Fill in the blank with the correct term.

$$x^2 - \_\_\_\_ + \frac{9}{4} = -2 + \frac{9}{4}$$

3. Complete the square in the following expression, but do not solve.

$$3y^2 - 12y + 3 = 0$$

4. Solve for a by completing the square.

$$2a^2 + 8a = -4$$

5. What is your first and second step in solving the problem by completing the square?

$$4x^2 - 16x + 28 = 0$$

6. Explain when and why completing the square is used for factoring.

7. Solve for y by completing the square.

$$3y^2 + 9y = 3$$

8. Fill in the blank with the correct term.

$$\_\_\_\_ - 4x = 6$$

$$\left(x - \frac{2}{3}\right)^2 = \frac{22}{9}$$

LONG DIVISION OF POLYNOMIALS

1. Find the quotient.

$$\frac{x^2+2x-1}{x+3}$$

2. Find the quotient.

$$\frac{2x^3-x^2-4x+5}{x-2}$$

3. Find the quotient.

$$\frac{2x^4+4x^3-x^2+5x-150}{x+4}$$

4. Find the quotient.

$$\frac{3x^3-x^2-7x+5}{x-1}$$

5. Find the quotient.

$$\frac{-x^2+3x+15}{x+5}$$

6. Find the quotient.

$$\frac{x^4+x-3}{x-2}$$

7. Find the quotient.

$$\frac{x^3+6}{x+6}$$

8. Find the quotient.

$$\frac{x^2+x}{x-3}$$

9. Find the quotient.

$$\frac{x^4-2x^2}{x-4}$$

10. Find the quotient.

$$\frac{-2x^3 + 8x}{x + 2}$$

THE UNIT CIRCLE

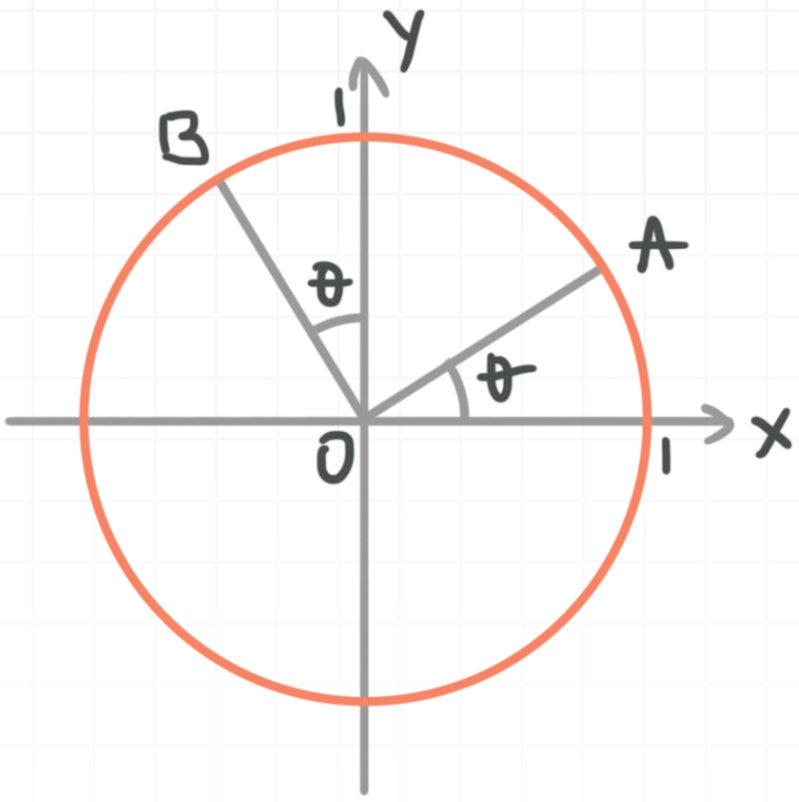
■ 1. What is the coordinate point associated with $\theta = 2\pi/3$ along the unit circle?

■ 2. The terminal side of the angle θ in $[0,2\pi)$ intersects the unit circle at the given point. Find the measure of θ in degrees.

$$\left(-\frac{1}{2}, -\frac{\sqrt{3}}{2}\right)$$

■ 3. Find $\sin\theta$ if $\theta \in [0,2\pi)$ and $\cos\theta = \sin\theta$.

■ 4. The points A and B lie on the unit circle in quadrants I and II respectively. The angle between OA and the positive x-axis is θ. The angle between OB and the positive y-axis is θ. Find the sine of $\angle AOB$.



■ 5. Evaluate the expression.

$$2\csc\left(\frac{49\pi}{6}\right) - 3\cos\left(\frac{13\pi}{3}\right) + \tan\left(\frac{25\pi}{4}\right)$$

■ 6. Find the angle θ in the interval $[0,2\pi)$.

$$\sin\theta = \frac{1}{2} \text{ and } \cos\theta = -\frac{\sqrt{3}}{2}$$

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