

Web Demo & Topics - Algebra 2

Objective Questions

1. Simplify: $5xy^2 + 8x - 9y^2 - 2x + 3y^2 - 8xy^2$

1) $3x^4 + x^3 - x^2 - x + 16$

2) $-3xy^2 + 6x - 6y^2$

3) $12xy + 15y + 8$

4) $6a + 4b - 17$

2. Compute the total amount of an investment after four years if the original amount deposited was \$5,000, the interest rate was 2 percent, and its compounded monthly.

1) \$5,416.07

3) \$5,216.07

2) \$5,316.07

4) \$5,116.07

3. Find the center, diameter and circumference of a circle whose equation is $x^2 + y^2 = 121$.

1) center is at $(0,0)$; diameter is 21 units; circumference is $20\pi = 65.08$

2) center is at $(0,0)$; diameter is 22 units; circumference is $22\pi = 69.08$

3) center is at $(0,0)$; diameter is 21 units; circumference is $20\pi = 64.08$

4) center is at $(0,0)$; diameter is 22 units; circumference is $22\pi = 63.08$

4. Determine the standard form of the circle

$$x^2 + y^2 + 18x + 81 = 0$$

1) $(x - 2)^2 + (y - 10)^2 = 16$

2) $(x + 7)^2 + y^2 = 1$

3) $(x - 1)^2 + (y - 10)^2 = 16$

4) $(x + 9)^2 + y^2 = 1$

5. Find the difference quotient.

$$f(x) = 3x^2 + x - 7$$

1) $3x^2 + 3xh + h^2$

2) 2

3) $6x + 3h - 2$

4) $6x + 2h + 1$

6. Find the center and the length of the two axis in

$$9(x + 3)^2 + 4(y + 1)^2 = 36.$$

1) center at $(-11,1)$; horizontal axis: 4 units; vertical axis: 2 units

2) center; $(2,2)$; horizontal axis; 10 units vertical axis: 16 units

3) center; $(-3,-1)$; horizontal axis; 4 units vertical axis: 6 units

4) center; $(7,0)$; horizontal axis; $1/2$ units; vertical axis: $1/4$ units

7. Find the equation of the circle whose points are all $\frac{1}{3}$ unit from the origin.

- 1) $x^2 + y^2 = \frac{1}{9}$
- 2) $(x + 6)^2 + (y - 7)^2 = 64$
- 3) $(x + 2)^2 + y^2 = 9$
- 4) $(x + 7)^2 + (y + 7)^2 = 49$

8. What is the intensity of an earthquake with an amplitude of 7,000 micrometers and a period of 0.05 seconds?

- 1) 5.2
- 2) 5.0
- 3) 5.3
- 4) 5.1

9. Factor $z^6 - 144$.

- 1) $(z^3 + 12)(z^3 - 12)$
- 2) $(z - 5)(z^2 + 5z + 25)$
- 3) $(z + 1)(z - 1)(z + 3)$
- 4) $(z^2 + 6)(z^2 + 5)$

10. Solve $x^2 + 6x - 7 = 0$ using completing the square.

- 1) $x = 2, x = -5$
- 2) $x = 3, x = \frac{5}{2}$
- 3) $x = 1, x = -7$
- 4) $x = 6, x = 0$

11. Alice is putting together a mixture of malted milk balls and chocolate raisins to make a bridge mix. The malted milk balls all cost \$2.25 per pound, and the chocolate covered raisins cost \$3.75 per pound. How many pounds of each should she use to make a mixture consisting of a total of 20 pounds and costing no more than \$51.00?

- 1) 16 pounds of malted milk buds and 4 pounds of chocolate covered raisins
- 2) 16 pounds of malted milk duds and 3 pounds of chocolate covered raisins
- 3) 16 pounds of malted milk duds and 6 pounds of chocolate covered raisins
- 4) 18 pounds of malted milk buds and 4 pounds of chocolate covered raisins

12. Determine whether or not the given values are upper and lower bounds for the zeros of the polynomial.

$$g(x) = x^3 + 11x^2 + 20x - 32; \text{ upper, } 2; \text{ lower, } -3$$

- 1) No, 2 is an upper bound; yes, -10 is a lower bound
- 2) No, 1 is not an upper bound; no, -1 is not a lower bound
- 3) yes, 2 is an upper bound; no, -2 is not a lower bound
- 4) yes, 2 is an upper bound; no, -3 is not a lower bound

13. Solve the system of equations using matrices.

$$2x + 3y - 5z = 1$$

$$6x - 9y + 10z = 2$$

$$4x - 6y + 15z = 3$$

1) $x = 1/2, y = 1/2, z = 1/5$

2) $x = 1/3, y = 1/3, z = 1/5$

3) $x = 1/2, y = 1/3, z = 1/5$

4) $x = 1/4, y = 1/3, z = 1/5$

14. Use the Remainder Theorem to do the evaluation.

If $f(x) = 8x^4 - 2x^3 + 4x^2 + 3x + 2$, find $f(1/4)$.

1) 1

2) 2

3) 3

4) 4

15. Is -1 a lower bound for the roots of

$$x^4 + 4x^3 - 3x^2 + 2x - 1 = 0?$$

1) Yes

2) No

16. Find all solutions of the equation.

$$9x^4 - 6x^3 - 80x^2 + 54x - 9 = 0$$

1) $x = 1/3, x = 1/3, x = 3, x = -3$

2) $x = -2, x = 3, x = 7$

3) $x = -4/3, x = -1, x = -1$

4) $x = -2, x = 3, x = 1, x = 1$

17. y varies inversely with x . When $x = 9$, y is 15.

What is y when x is 6?

1) $65/2$

3) $31/2$

2) $55/2$

4) $45/2$

18. Solve for y in $y^6 + 19y^3 = 216$

1) $x = 2, x = 1$

2) $x < -9$ and $x > 3$

3) $y > -8$ or $y > 1$

4) $y = -3, y = 2$

19. Solve $y^2 + 7y - 8 > 0$.

1) $y = 2, y = 1$

2) $y < -9$ and $y > 3$

3) $y > -8$ or $y > 1$

4) $y = -3, y = 2$

20. Change the equation $x^2 + 8x - 6y + 40 = 0$ into the standard form for a parabola. Then find the vertex and opening direction.

1) center: $(3, -3)$; opens left and right

2) center: $(-9, -2)$ opens upward and downward

3) center: $(-2, 1)$ opens up and down

4) $y - 4 = 1/6(x + 4)^2$; vertex: $(-4, 4)$; opens upward

Algebra 2 - Open Response

1.

$$\text{Simplify: } \left(\frac{x^2 y}{2w^4 z} \right)^4 \left(\frac{w^4 z^6}{xy} \right)^4$$

2. Use function transformations to graph

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

Use function transformations to graph

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

3. Divide $4 + 5$ and $6 - 3i$.

4. Solve $x^2 - 3x + 9 = 0$

5. The volume of a gas varies directly with the temperature and inversely with the pressure. When the temperature of a particular gas is 300°F , the pressure is 45 pounds per square inch and the volume is 15 cubic feet. What is the volume when the pressure decreases to 30 pounds per square inch, and the temperature increases to 330°F ?

6. Solve the quadratic equation.

$$2x^2 - 3x + 8 = 0$$

7. What is the center and radius of a circle is

$$(x - 3)^2 + (y - 4)^2 = 25?$$

8. Write the equation of the ellipse

$$x^2 + 100y^2 + 6x - 800y + 1509 = 0 \text{ in standard form.}$$

9. Change the equation $x^2 + 8x - 6y + 40 = 0$ into the standard form for a parabola. Then find the vertex and opening direction.

10. Solve the system using Cramer's rule.

$$100x - y = 10$$

$$300x + 4y = 20$$

Topics – Algebra 2

Adding and Subtracting Polynomials

Complex Numbers

Composition of Functions

Compound Interest

Conic Sections

Difference Quotient

Dividing Polynomials

Ellipse

Equations of Circles
Exponential Functions
Factor Trinomials
Factor by Grouping
Factoring Quadratic - Completing the Squares
Factoring Quadratic
Function Operations : Addition - Subtraction - Multiplication - Division
Function Operation and Transformations
Graphing - Rational Numbers
Graphing Conics
Graphing Functions Using Transformations
Graphing Radical Functions
Graphing Equations or Inequalities
Graphing polynomials
Graphing: Solving Equations and Inequalities
Greatest Common Factoring
Hyperbola
Inverse Functions
Laws of Logarithms
Linear Equations Addition and Subtractions of Matrices
Linear Equations using Addition
Linear Equations using Cramer's Rule
Linear Equations using Substitution
Logarithmic Functions
Multiplying Polynomials (FOIL Method)
Non-Linear Equations
Operations Involving Complex Numbers
Parabola
Polynomials - Long and Synthetic Division
Polynomials
Quadratic Formula and Complex Numbers
Quadratic and Other Inequalities
Radical Equations with Quadratics
Rational Equations
Rational Root Theorem and Descartes' Rule of Sign
Rationalizing a Denominator and Conjugates
Remainder Theorem
Solving Binomials
Solving Equations Using Matrices
Special Products
Systems of Inequalities
The Constant "e"
The Law of Logarithms
Transformations
Upper and Lower Bounds
Using Exponents
Word Problems - Solving Equations Using Matrices
Word Problems Using Linear Equations

Algebra 2 - Essay Topics

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Complex Numbers
Composition of Functions
Compound Interest
Conic Sections
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