NAME _____ DATE 02/16/21 PERIOD _____

AMI Lesson 1

Find $(f+g)(x)$, $(f-g)(x)$, $(f \cdot g)(x)$, and $\left(\frac{f}{g}\right)(x)$ for each $f(x)$ and $g(x)$.

1. $f(x) = 8x - 3; g(x) = 4x + 5$

$(f+g)(x) =$

$(f-g)(x) =$

$(f \cdot g)(x) =$

$\left(\frac{f}{g}\right)(x) =$

2. $f(x) = 3x^2 - x + 5; g(x) = 2x - 3$

$(f+g)(x) =$

$(f-g)(x) =$

$(f \cdot g)(x) =$

$\left(\frac{f}{g}\right)(x) =$

For the set of ordered pairs, find $f \circ g$ and $g \circ f$ if they exist.

3. $f = \{(5, -2), (9, 8), (-4, 3), (0, 4)\}$,
$g = \{(3, 7), (-2, 6), (4, -2), (8, 10)\}$

$f \circ g =$

$g \circ f =$

Find $[f \circ g](x)$ and $[g \circ f](x)$.

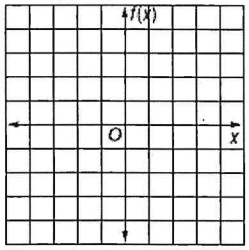
4. $f(x) = 5x + 4; g(x) = 3 - x$

$[f \circ g](x) =$

$[g \circ f](x) =$

Find the inverse of each function. Then graph the function and its inverse.

5. $f(x) = 2x - 3$



Determine whether each pair of functions are inverse functions.

6. $f(x) = 2x + 5$

$g(x) = 5x + 2$

7. $f(x) = \frac{1}{4}x + 5$

$g(x) = 4x - 20$

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AMI Lesson 2

Simplify. Assume that no variable equals 0.

1. $c^8 \cdot c^{-4} \cdot c^6$

2. $\frac{b^8}{b^5}$

3. $(a^4)^6$

Express each number in scientific notation.

4. 385,000,000

5. 0.000052

Evaluate. Express the result in scientific notation.

6. $(3.2 \times 10^5)(5 \times 10^4)$

7. $\frac{1.12 \times 10^{-1}}{1.6 \times 10^4}$

Simplify.

8. $(7x^2 - 6x + 3) - (4x^2 + 8x - 3)$

9. $(-4m^2 - 6m) - (4m + 5m^2)$

Find each product.

10. $(5x - 3)(3x - 6)$

11. $2(a - 3)(4a + 7)$

Simplify.

12. $\frac{12c^3 + 32c^2}{4c}$

13. $(3x^2 - 7x - 6) \div (x - 3)$

Factor completely. If the polynomial is not factorable, write *prime*.

14. $t^4 - 16$

15. $49d^6 - 25$

Given a polynomial and one of its factors, find the remaining factors of the polynomial. Some factors may not be binomials.

16. $x^3 + 15x^2 + 71x + 105; x + 7$

17. $x^3 - 7x^2 - 26x + 72; x + 4$

Descartes' Rule of Signs	If $P(x)$ is a polynomial with real coefficients whose terms are arranged in descending powers of the variable, • the number of positive real zeros of $y = P(x)$ is the same as the number of changes in sign of the coefficients of the terms, or is less than this by an even number, and • the number of negative real zeros of $y = P(x)$ is the same as the number of changes in sign of the coefficients of the terms of $P(-x)$, or is less than this number by an even number.

State the number of positive real zeros, negative real zeros, and imaginary zeros for each function, and List all of the possible rational zeros of each function.

18. $f(x) = x^3 + 4x^2 - 5x + 6$

$f(-x) =$

+r.z. =

−r.z. =

i.z. =

$\frac{p}{q}$:

19. $f(x) = x^5 - 5x^4 + 3x^2 + 4x - 6$

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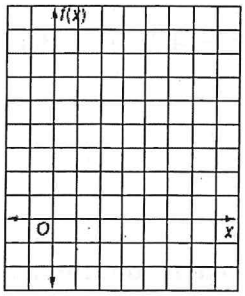
AMI Lesson 3

For Exercise 1, complete parts a–c for the quadratic function.

a. Find the y-intercept, the equation of the axis of symmetry, and the x-coordinate of the vertex.
b. Make a table of values that includes the vertex.
c. Use this information to graph the function.

1. $f(x) = x^2 - 6x + 8$



Determine whether each function has a maximum or minimum value, and find the maximum or minimum value. Then state the domain and range of the function.

2. $f(x) = x^2 + 2x + 15$

3. $f(x) = -2x^2 + 4x - 3$

Solve each equation by factoring.

4. $x^2 - 9x = 0$

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

Write a quadratic equation with the given roots. Write the equation in standard form.

6. $-2, -5$

7. $-\frac{1}{3}, -3$

Simplify.

8. $\sqrt{99}$

9. i^{66}

$i^1 = i$
$i^2 = -1$
$i^3 = -i$
$i^4 = 1$

10. $(10 - 4i) - (7 + 3i)$

11. $(3 + 4i)(3 - 4i)$

Solve each equation.

12. $3x^2 + 3 = 0$

13. $5x^2 + 125 = 0$

Solve each equation by using the Square Root Property.

14. $x^2 + 20x + 100 = 64$

15. $9x^2 - 12x + 4 = 4$

Solve each equation by completing the square.

16. $x^2 - 4x - 13 = 0$

17. $x^2 + 3x - 6 = 0$

Solve each equation by using the Quadratic Formula.

18. $x^2 + 3x + 6 = 0$

19. $3x^2 + 9x - 2 = 0$

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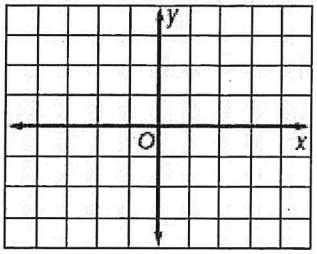
AMI Lesson 4

Solve each system of equations by graphing.

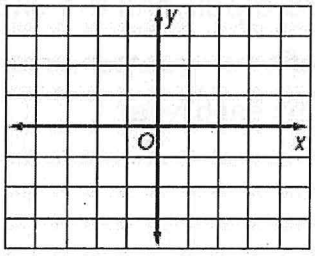
1. $x + 3y = 6$

   $2x - 2y = 4$



2. $2x - 2y = 0$

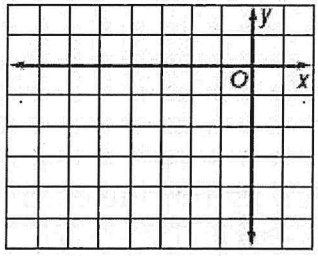
   $y = 2x - 2$



Graph each system of equations and describe it as *consistent and independent*, *consistent and dependent*, or *inconsistent*.

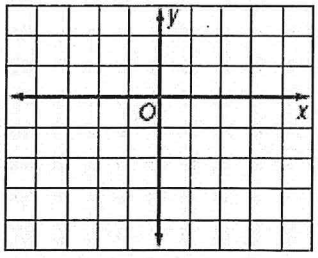
3. $y = -2x - 2$

   $2x + y = -5$



4. $3x - y = 4$

   $x + 2y = 0$



SPORTS For Exercises 5 and 6, use the following information.
Last year the volleyball team paid $4 per pair for socks and $12 per pair for shorts on a total purchase of $232. This year they spent $260 to buy the same number of pairs of socks and shorts because the socks now cost $5 a pair and the shorts cost $13.

5. Write a system of two equations that represents the number of pairs of socks and shorts bought each year.

6. How many pairs of socks and shorts did the team buy each year?

7. **FITNESS TRAINING** Carly is training for a triathlon. In her training routine each week, she runs 6 times as far as she swims, and she bikes 4 times as far as she runs. One week she trained a total of 248 miles. How far did she run that week?