Student: _____	**Instructor:** Carol Fare	**Assignment:** MP4 exam
Date: _____	**Course:** Algebra 1 period 1	
Time: _____	**Book:** *Algebra 1 Common Core (2015)	

1. Simplify the expression.

$d(d^{-6})^{-7}$

$d(d^{-6})^{-7} = \square$

(Type exponential notation with positive exponents.)

2. Multiply.

$(3x+5)(2x^2+7x+7)$

The answer is $\square$.

(Simplify your answer.)

3. Find the equation of the axis of symmetry and the coordinates of the vertex of the graph of the following function.

$y = x^2 - 10x - 3$

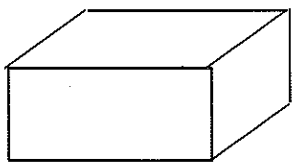
What is the equation of the axis of symmetry?

$\square$ (Type an equation. Simplify your answer.)

The vertex is $\square$. (Type an ordered pair.)

4. Find expressions for the possible dimensions of the rectangular prism.

$V = 4y^3 + 12y^2 + 9y$



The possible dimensions of the rectangular prism are $\square$.

(Use a comma to separate answers as needed.)

5. Use the quadratic formula to solve the equation.

$7x^2 - 6x - 2 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ $x =$ ▪
  (Round to the nearest hundredth as needed. Use a comma to separate answers as needed.)
- ○ The solution is not a real number.

6. Use a vertical format to subtract the polynomials.

$$\begin{array}{r} 7x^2 - 9x + 5 \\ -(11x^2 + 6x - 1) \\ \hline \end{array}$$

The difference is ☐. (Simplify your answer.)

7. Simplify the product using the distributive property.

$(7m+4)(9m-2)$

$(7m+4)(9m-2) =$ ☐ (Simplify your answer.)

8. Add the polynomials.

$(2x^2 - 8x + 7) + (5x^3 - 5x)$

The sum is ☐. (Simplify your answer.)

9. Multiply.

$(5x-8)^2$

$(5x-8)^2 =$ ☐ (Simplify your answer.)

10. The radius of a cylindrical gift box is $(3x+1)$ inches. The height of the gift box is three times the radius. What is the surface area of the cylinder? Write your answer as a polynomial in standard form.

The surface area of the cylinder is ☐.
(Simplify your answer. Type an exact answer, using π as needed.)

11. Solve by factoring.

$p^2 + 3p - 54 = 0$

$p =$ ☐ (Use a comma to separate answers as needed.)

12. Factor the expression completely.

$25x^2 - 35x - 30$

$25x^2 - 35x - 30 =$ ☐

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13. Use the quadratic formula to solve the equation.

$-2x^2 - 7x + 4 = 0$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

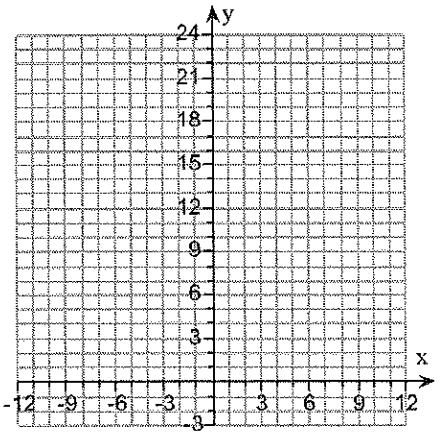
- ○ $x =$ ■
  (Use a comma to separate answers as needed.)
- ○ The solution is not a real number.

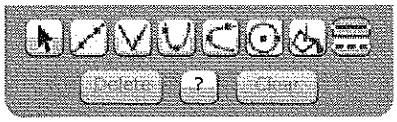
14. Graph the function. Then identify the domain and range of the function.

$f(x) = \frac{1}{2}x^2$

Use the graphing tool to graph the equation.

Click to enlarge graph





Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

(Type an inequality or a compound inequality. Simplify your answer.)

- ○ The range is ■ and the domain is ■.
- ○ The domain is all real numbers and the range is ■.
- ○ The range is all real numbers and the domain is ■.
- ○ The range and domain are all real numbers.

15. Find the product.

$(9x + 1)^2$

$(9x + 1)^2 =$ ☐

16. Solve by factoring.

$5r^2 - 16r = 16$

Select the correct choice and fill in any answer boxes in your choice below.

○ $r =$ ▪

(Simplify your answer. Type an integer or a fraction. Use a comma to separate answers as needed.)

○ The solution is not a real number.

17. Factor the trinomial completely.

$x^2 + 2x - 15$

$x^2 + 2x - 15 =$ □

18. Express with positive exponents.

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

Choose the correct expression with positive exponents.

○ $\left(\frac{x}{y}\right)^{-1}$

○ $\frac{y^2}{x}$

○ xy^2

○ $\left(\frac{x}{y}\right)^{3}$

19. Find the product.

$(x + 6y)^2$

$(x + 6y)^2 =$ □ (Simplify your answer.)

20. Simplify the expression.

$$\frac{21x^3y^6}{7x^2y}$$

$$\frac{21x^3y^6}{7x^2y} = \square$$

21. During halftime of a soccer game, a sling shot launches T-shirts at the crowd. A T-shirt is launched from a height of 6 feet with an initial upward velocity of 72 feet per second. The T-shirt is caught 35 feet above the field. How long will it take the T-shirt to reach its maximum height? What is the maximum height? What is the range of the function that models the height of the T-shirt over time?

The T-shirt takes ☐ second(s) to reach its maximum height.
(Type an integer or a decimal.)

The T-shirt's maximum height is ☐ feet above the field.
(Type an integer or a decimal.)

What is the range of the function?

- ○ $6 \le h \le 87$
- ○ $35 \le h \le 87$
- ○ All real numbers
- ○ $0 \le h \le 87$

22. Factor the polynomial.

$17x^3y^3 + 51x^5y$

$17x^3y^3 + 51x^5y =$ ☐ (Factor completely.)

23. Find the number of real-number solutions of the equation below.

$x^2 + 6x - 9 = 0$

Choose the correct answer below.

- ○ The equation has two real-number solutions.
- ○ The equation has one real-number solution.
- ○ The equation has no real-number solution.

24. A circular mirror is surrounded by a square metal frame. The radius of the mirror is 5x. The side length of the metal frame is 20x. What is the area of the metal frame?

The area of the frame is ☐ square units.
(Type your answer in factored form. Type an exact answer in terms of π.)

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25. The given expression represents the area. Find the side length of the square.

$4x^2+28x+49$

The length of one side is ☐.
(Simplify your answer.)

26. Answer parts a and b below.

a) What is the vertex of the function $y = 5x^2 + 10x + 6$?
b) What is the vertex of the quadratic function given in the table?

x	−3	−2	−1	0	1
y	3	−3	−5	−3	3

a) What is the vertex of the function $y = 5x^2 + 10x + 6$?

The vertex is ☐. (Type an ordered pair.)

b) What is the vertex of the function given in the table?

The vertex is ☐. (Type an ordered pair.)

27. What is the simplified form of the following expression?

$-9x^3 \cdot 8x^9$

$-9x^3 \cdot 8x^9 =$ ☐ (Simplify your answer. Use positive exponents only.)

28. Use the zero-product property to solve the following equation.

$-2n(5n-4) = 0$

$n =$ ☐ (Simplify your answer. Use a comma to separate answers as needed.)

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29. Graph the function. Identify the axis of symmetry and the vertex.

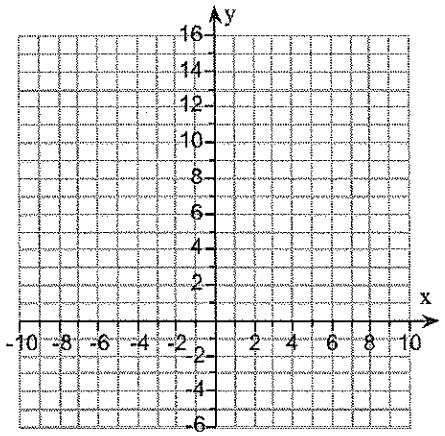
$f(x) = x^2 - 4x + 5$

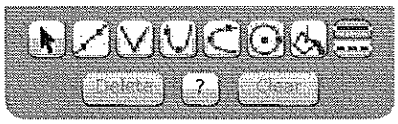
The axis of symmetry is ☐.
(Type an equation.)

The vertex is ☐.
(Type an ordered pair.)

Use the graphing tool to graph the parabola.

Click to enlarge graph





30. Factor the expression.

$192s^2 - 147$

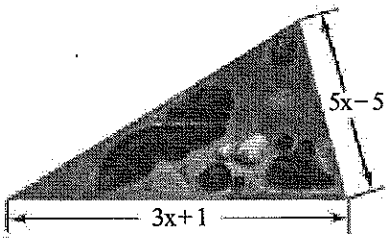
$192s^2 - 147 =$ ☐
(Type your answer in factored form.)

31. Factor by grouping.

$9r^3 + 15r^2 - 15r - 25$

$9r^3 + 15r^2 - 15r - 25 =$ ☐

32. The perimeter of the triangular park shown on the right is $15x - 6$. What is the missing length?



The missing length is ☐. (Simplify your answer.)

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33. Solve the equation by graphing the related function.

$$\frac{1}{9}x^2 - 9 = 0$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ $x =$ ▪ (Simplify your answer. Use a comma to separate answers as needed.)
- ○ The solution is not a real number.

34. Solve the equation by finding square roots.

$$5x^2 - 80 = 0$$

Solve the equation for x. Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- ○ $x =$ ▪ (Simplify your answer. Use a comma to separate answers as needed.)
- ○ There are no real solutions.

35. Write the following equation in standard form. Then solve.

$$9q^2 - 4q = 8q^2 - 6q + 35$$

The equation in standard form is ☐.

$q =$ ☐ (Use a comma to separate answers as needed.)

36. Use the distributive property to multiply.

$$(y + 4)(2y^2 + 5y - 6)$$

$(y + 4)(2y^2 + 5y - 6) =$ ☐ (Simplify your answer.)

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37. Write an equivalent expression with positive exponents only.

x^6y^{-2}

Which choice is correct?

- ○ $\frac{1}{x^6y^2}$
- ○ $\frac{x^6}{y^2}$
- ○ $(xy)^4$
- ○ xy^4