CLASSICAL PREP: ALGEBRA II SUMMER WORK

Add your family to our Algebra II Summer Work Google Classroom!

- Log into your student's CPS Google account
- Go to classroom.google.com
- Add yourself to the Algebra II Summer Google Classroom by using the following class code: **a2dzcxp6**
- Videos and IXL codes will be in the Classwork section, separated by topic

MATH WORKSHEET PACKET DIRECTIONS

- Work through the provided math packet, which has been created based on 2025 FAST math scores and the recommendations of instructors.
- It is likely that some of these topics will be a stretch for many scholars. Please exhibit fortitude, working consistently and seeking out resources for help.
- Aim for a few pages per week, focusing on understanding and mastery rather than speed.
- **IF YOU GET STUCK OR DON'T KNOW WHERE TO START:**
    - Watch the videos posted on our Google Classroom.
    - Practice an IXL code (listed on the Google Classroom).
    - Move on to something else and come back to that page

A NOTE ABOUT IXL OVER THE SUMMER

IXL is an **invaluable** resource for bridging gaps, especially in math. Please feel free to use it to practice concepts that are not yet mastered. The IXL diagnostic can help you pinpoint areas for growth, and recommended skills are a great place to start for additional practice.

You will find several IXL codes assigned to you, in addition to the assignments in this packet, on the following page. The expectation is that you will work for AT LEAST 20 minutes or until you reach a SmartScore of 85. Please record both your SmartScore and the time you spend on the checklist sheet.

While you are not assigned any additional IXL, we highly recommend that you work through additional codes

CLASSICAL PREP: ALGEBRA II

MATH PACKET PAGES CHECKLIST

EXPECTATIONS:

- All work will be shown to justify answer.
- All work will be neatly written either in the space on the worksheet or, if there is not enough space, on lined paper.
- Work will be organized, clear, and complete.

- ❑ Adding, Subtracting, and Multiplying Polynomials (2 pages)
- ❑ Multiplying Polynomials (2 pages)
- ❑ Solving Systems of Linear Equations
    - ❑ Resource Sheets & Practice Problems (2 pages)
    - ❑ Solve Using Substitution (3 pages)
    - ❑ Solve Using Elimination (4 pages)
    - ❑ Word Problems Using Systems of Equations
- ❑ Functions & Relations Worksheet (2 pages)
    - ❑ IXL Code: DHB (Identify linear, quadratic, and exponential functions from graphs)
        - ❑ SmartScore: ____________
        - ❑ Time Spent:: ____________
    - ❑ IXL Code: SP5 (Identify linear, quadratic, and exponential functions from tables)
        - ❑ SmartScore: : ____________
        - ❑ Time Spent: : ____________
    - ❑ IXL Code: R96 (Evaluate a function)
        - ❑ SmartScore: : ____________
        - ❑ Time Spent: : ____________
    - ❑ IXL Code: VNZ (Evaluate a function: Plug in an expression)
        - ❑ SmartScore: : ____________
        - ❑ Time Spent: : ____________
- ❑ Solving Quadratic Equations Using All Methods (2 pages)
- ❑ Lesson 8: Application of Quadratics (5 pages)

IM1 - Task 6.4 Name________________________________ ID: 1

Adding, Subtracting, & Multiplying Polynomials

Date________________ Period____

Warm-up: Simplify each expression.

1) $(6k - 7k^2) + (4k^2 + 6)$

2) $(8 - 5k^2) - (7k^2 + 5)$

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

4) $(5p^2 - 8) - (3p + 4 - 5p^2)$

5) $(6n - 4n^4 + 5n^3) + (n^3 - 6n^4 + 7n)$

6) $(6x^4 - x^3 + 5) - (2x^4 + 3x^3 - 1)$

Multiplying Polynomials: Find each product.

7) $(5p + 3)(8p + 7)$

8) $(3a + 3)(3a - 2)$

9) $(3x + 5)(7x - 4)$

10) $(4x + 5)(4x + 6)$

11) $(k - 2)(6k + 1)$

12) $(4m + 2)(4m + 5)$

13) $(5n + 4)(4n^2 + 2n - 4)$

14) $(5b - 6)(5b^2 + 4b - 2)$

15) $(3x + 4)(5x^2 - 6x - 6)$

16) $(8x + 2)(3x^2 + 4x - 5)$

17) $(8n^2 + n - 4)(6n^2 - 6n - 4)$

18) $(6x^2 + 6x + 2)(3x^2 + 5x + 7)$

19) $(4v^2 - 7v - 7)(3v^2 + v + 4)$

20) $(8x^2 + 3x + 1)(3x^2 - 7x + 6)$

Simplifying Radicals: Simplify (show all your work)

21) $\sqrt{8}$

22) $\sqrt{45}$

23) $\sqrt{125}$

24) $\sqrt{18}$

25) $\sqrt{45}$

26) $\sqrt{180}$

27) $\sqrt{216}$

28) $\sqrt{150}$

29) $\sqrt{225}$

30) $\sqrt{500}$

31) $\sqrt{175}$

32) $\sqrt{8}$

33) $\sqrt{12m^2}$

34) $\sqrt{48k^3}$

35) $\sqrt{216a^2}$

36) $\sqrt{125a^2}$

37) $\sqrt{36x^3y^3}$

38) $\sqrt{27x^3y}$

ID: 1

Keystone Algebra 1

Name________________________________

Multiplying Polynomials

Date________________ Period____

Find each product.

1) $8x(-6x + 7)$

2) $4n(6n + 7)$

3) $8(2x + 6y)$

4) $-4(5a + 6b)$

5) $(8x + 2)(x + 6)$

6) $(-5n + 8)(-8n - 4)$

7) $(-5m - 7n)(7m - 4n)$

8) $(-4x + 8y)(-8x + 5y)$

9) $(-2x+7)(8x^2+5x+4)$

10) $(4n-5)(-2n^2+4n-4)$

11) $(-a^2-3a+7)(-5a+7)$

12) $(4k^2-2k-3)(3k-5)$

13) $(7x+2y)(3x^2+5xy+6y^2)$

14) $(5u+5v)(2u^2-2uv-6v^2)$

15) $(4x^2+4x+2)(-6x^2-6x-4)$

16) $(8p^2+3p+5)(-p^2-5p-7)$

17) $(2u^2+7uv-6v^2)(2u^2-6uv+6v^2)$

18) $(4x^2-4xy-6y^2)(2x^2+xy+8y^2)$

Solving Systems of Linear Equations

There are two algebraic ways of solving a system of equations. Here is a reminder of each.

Example 1: Solve: $2x + 3y = 10$
$4x - 3y = 8$

Solution

If we add the left-hand sides and the right-hand sides of these equations, the *y* terms will drop out. We will be left with an equation in *x* only, which we can solve easily.

$$\begin{aligned} 2x + 3y &= 10 \\ 4x - 3y &= 8 \\ \hline 6x + 0 &= 18 \\ x &= 3 \end{aligned}$$

We now know that *x* = 3 is part of the solution of the system. We substitute 3 for x in either equation and solve for *y*.

$$\begin{aligned} 2x + 3y &= 10 \\ 2(3) + 3y &= 10 \\ 6 + 3y &= 10 \\ 3y &= 4 \\ y &= \tfrac{4}{3} \end{aligned}$$

So, the solution is $(3, \frac{4}{3})$.

Example 2: Solve: $2x + 9y = 49$
$5y = 31 - 3x$

Solution:

First we rewrite the equations with the variables in the same order on the same side. That makes everything easier.

$$\begin{aligned} 2x + 9y &= 49 \\ 3x + 5y &= 31 \end{aligned}$$

In order to be able to eliminate one variable, we want the coefficients of *x* or those of *y* to be additive inverses. The coefficients of *x* will be inverses if we multiply the first equation by 3 and the second equation by -2. Then we can add left-hand and right-hand sides, eliminating *x*, and solve for *y*. We get

$$\begin{aligned} 6x + 27y &= 147 && \text{Multiplying by 3} \\ -6x - 10y &= -62 && \text{Multiplying by -2} \\ \hline 17y &= 85 \\ y &= 5 \end{aligned}$$

Then we can substitute 5 for *y* in one of the original equations and solve it for *x*.

$$\begin{aligned} 3x + 5(5) &= 31 && \text{Substituting for x} \\ 3x + 25 &= 31 \\ 3x &= 6 \\ x &= 2 && \text{Simplifying} \end{aligned}$$

So, the solution is (2,5).

Example 3: Solve: $y = 2x + 4$
$6y + 3x = 54$

Solution

The first equation tells us that $y = 2x + 4$, so we can substitute $2x + 4$ for y in the second equation:

$$
\begin{aligned}
6y + 3x &= 54 \\
6(x + 4) + 3x &= 54 \\
12x + 24 + 3x &= 54 \\
15x + 24 &= 54 \\
15x &= 30 \\
x &= 2
\end{aligned}
$$

Then we can substitute 2 for *x* in one of the original equations and solve it for *y*. The first equation seems easiest.

$y = 2x + 4$	
$y = 2(2) + 4$	Substituting for x
$y = 8$	Simplifying

We now have (*x*, *y*) = (2, 8). To check, we substitute these values for x and y in the two equations.

$y = 2x + 4$	$6y + 3x = 54$
$8 = 2(2) + 4$	$6(8) + 3(2) = 54$
$8 = 4 + 4$	$48 + 6 = 54$
$8 = 8$	$54 = 54$

So, the solution is (2, 8).

PRACTICE

Exercises: Use either method to solve the systems below.

1. $6x - 8y = 34$
   $y = 3x - 2$

2. $3x + 2y = 20$
   $x + y = 8$

3. $4x + 6y = 26$
   $6x - 2y = 28$

4. $y = x + 1$
   $y = -2x + 1$

5. $2x = 3y - 1$
   $y = 5$

Solutions

1. $(-1, -5)$ 2. (4,4) 3. (5,1) 4. (0,1) 5. (7,5)

SOLVE USING SUBSTITUTION.

#2. $3x - 5y = 11$
$x = 3y + 1$

#3. $y = x - 4$
$2x + y = 5$

#4. $x + 4y = 6$
$x = -y + 3$

#5. $2x + y = 1$
$x = 23 + 4y$

[DAY #2]

Solve the following systems of equations by substitution.

1.) $3x + 4y = 2$
$x = y + 3$

2.) $2x - 5y = 14$
$y = 3x + 5$

3.) $3x - y = 12$
$y = 2x - 7$

4.) $5x + y = 9$
$3x + 2y = -3$

Try these…

1.) $3x + 2y = 16$
$x = 2y - 8$

2.) $3x - 8y = 17$
$y = 2x - 7$

3.) $5x - y = 8$
$y = 3x$

4.) $3x + y = 13$
$5x + 4y = -4$

SOLVE USING ELIMINATION

- When using Elimination you must __multiply__ the ***entire*** equation by a constant to eliminate one of the __variables__
- Sometimes you might need to multiply BOTH equations by a __constant__ to eliminate the variable

<u>Example #2</u>: Solve this system of linear equations using the elimination method.

ORIGINAL SYSTEM	NEW SYSTEM	SOLUTION
$2x + 3y = 7$ $x - y = 1$		

<u>Example #3</u>: Solve this system of linear equations using the elimination method.

ORIGINAL SYSTEM	NEW SYSTEM	SOLUTION
$2x - 5y = 18$ $7x + y = 26$		

Try these...

Solve each system of equations by writing a new system that eliminates one of the variables.

1.) $5x + y = 6$
$3x - 4y = 22$

2.) $2x + 5y = -20$
$7x + 5y = 5$

3.) $7x - 3y = 2$
$2x + 6y = -20$

4.) $9x + 5y = 5$
$2x + 10y = -30$

[DAY #4]

Some times when solving a system of equations by elimination, you have to multiply BOTH equations in order for something to cancel out.

1.) $3x - 5y = 29$
$2x + 3y = -6$

2.) $8x - 3y = -13$
$3x + 5y = -11$

3.) $3x + 4y = -10$
$2x + 5y = -2$

4.) $6x - 4y = 38$
$5x - 3y = 31$

Try these…

1.) $2x + 4y = -8$
$3x - 5y = 21$

2.) $7x + 2y = 42$
$3x - 8y = -44$

3.) $6x - 3y = 0$
$2x + y = -10$

4.) $3x + 2y = -14$
$7x + 8y = -11$

Word Problems Using Systems of Equations

34. Your aunt and uncle have been visiting at your home. Five minutes after they drive away, you realize that they forgot their luggage. You happen to know that they drive slowly, so you get in your car and drive to catch up with them. Your average speed is 10 miles an hour faster that their average speed, and you catch up with them in 25 minutes. How fast did you drive?

35. You run an accounting business that specializes in auditing (verifying accounting records). One of your auditors is working on the payroll records for a company with 75 employees. Some are part-time and some are full-time. After working for three days, your auditor tells you that the audit is completed for half of the full-time employees, but there are still 50 employee records to audit. Find out how many of the employees are full time and how many are part-time.

36. You invited 56 people to your graduation party. You can afford to rent 5 tables, round and/or rectangular (each costing the same). Each round table can seat 8 people and each rectangular table can seat 12 people. How many round and rectangular tables should you rent?

37. You collect baseball and football cards. Your uncle has an old collection of 360 cards that he gives to you. The collection has more baseball cards than football cards. In fact, it has 30 more baseball cards than twice the number of football cards. How many of each type are in your uncle's collection?

38. Your family receives basic cable television and one movie channel for $39 a month. Your neighbor receives basic cable and two movie channels for $45.50. What is the monthly charge for basic cable? (Assume that each movie channel has the same monthly charge.)

39. A hotel has 260 rooms. Some are singles, and some are doubles. The singles cost $35 and the doubles cost $60. Because of a math teachers' convention, all of the hotel rooms are occupied. The sales for this night are $14,000. How many of each type of room does the hotel have?

40. Tickets for the homecoming dance cost $20 for a single ticket or $35 for a couple. Ticket sales totaled $2280, and 128 people attended. How many tickets of each type were sold?

41. A grain storage warehouse has a total of 30 bins. Some hold 20 tons of grain each, and the rest hold 15 tons each. How many of each type of bin are there if the capacity of the warehouse is 510 tons?

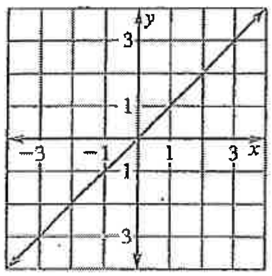
42. An overseas phone call is charged at one rate (a fixed amount) for the first minute and at a different rate for each additional minute. If a 7 minute call costs $10, and a 4 minute call costs $6.40, find each rate.

43. A financial planner wants to invest $8000, some in stocks earning 15% annually and the rest in bonds earning 6% annually. How much should be invested at each rate to get a return of $930 annually from the two investments?

Functions and Relations Worksheet

Decide whether the graph represents y as a function of x. Explain your reasoning.

1.



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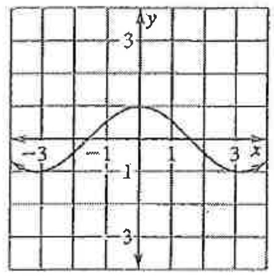

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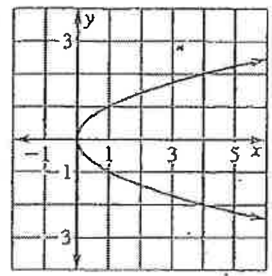
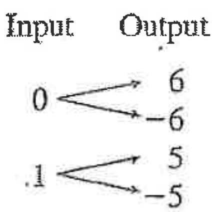


Decide whether the relation is a function. If it is a function, give the domain and range.

4.



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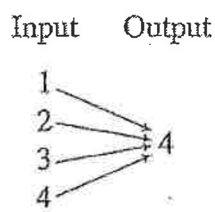

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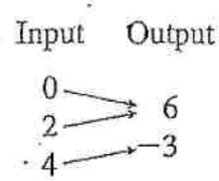


Evaluate the function when x = 3, x = 0, and x = -2.

7. $f(x) = x$

8. $h(x) = x + 7$

9. $g(x) = x - 2$

10. $g(x) = 3x$

11. $g(x) = 4x - 1$

12. $h(x) = 1.2x$

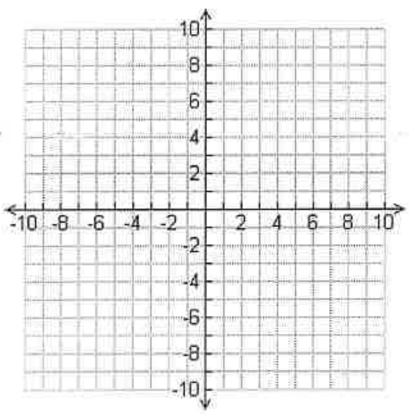
13. $f(x) = 1.5x - 2$

14. $h(x) = -4x + \frac{1}{2}$

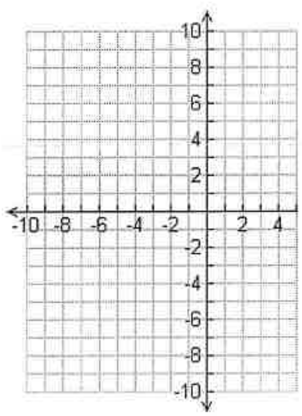
15. $f(x) = \frac{1}{3}x + \frac{2}{3}$

Graph the function.

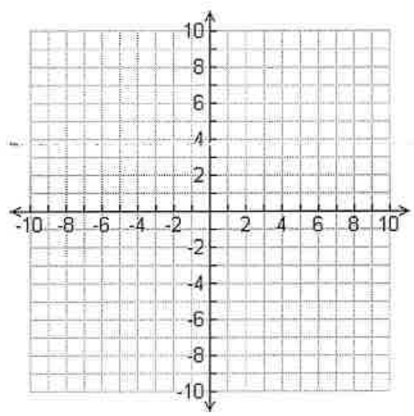
16. $f(x) = x - 3$



17. $g(x) = 3x$



18. $h(x) = 2x + 1$



Hon Geom Quadratics Unit

Name______________________________

Solving Quadratic Equations Using All Methods

Date________________ Period____

Solve each equation by factoring.

1) $x^2 - 8x + 16 = 0$

2) $2n^2 - 18n + 40 = 0$

3) $x^2 - 49 = 0$

4) $3x^2 - 75 = 0$

5) $5k^2 - 9k + 18 = 4k^2$

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

7) $3a^2 = -11a - 6$

8) $14n^2 - 5 = 33n$

9) $5k^2 + 28 = 27k$

10) $3n^2 - 5n = 8$

Solve each equation by taking square roots.

11) $-8 - 5n^2 = -88$

12) $4 - 2a^2 = -7$

13) $5n^2 - 2 = -92$

14) $(m + 8)^2 = 72$

Solve each equation by completing the square.

15) $r^2 - 8r - 22 = 6$

16) $k^2 - 18k + 8 = -9$

17) $x^2 + 14x + 96 = 0$

18) $a^2 - 10a + 52 = 0$

19) $x^2 - 12x - 17 = 0$

20) $x^2 + 20x + 28 = 9$

Solve each equation with the quadratic formula.

21) $4v^2 + 7v - 7 = 0$

22) $-8b^2 - 3b + 22 = 0$

23) $5x^2 + 4x - 15 = 0$

24) $9x^2 - 12x + 12 = 0$

25) $11r^2 + 7r = 3$

26) $r^2 = -8r + 65$

Lesson 8: Applications of Quadratics

Quadratic Formula: $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$; **Vertex:** $\left(\frac{-b}{2a}, f\left(\frac{-b}{2a}\right)\right)$

Standard:

- **F.IF.7** Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
- **F.IF.7a** Graph linear and quadratic functions and show intercepts, maxima, and minima.
- **F.IF.4** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.

Essential Question: How can we use the characteristics of quadratic equations to solve application problems?

Galileo was a famous scientist who made many contributions in the areas of astronomy and physics. One of his most important discoveries was **vertical motion**—when an object is dropped or falls, the distance it travels is a quadratic function of the time. Any object thrown, launched, or shot upward can be modeled by the following equation:

$$s = -\frac{1}{2}at^2 + v_0 t + s_o$$

where a is the acceleration from gravity, v_0 is the initial upward velocity, s_0 is the initial distance off the ground, and s is the height after t seconds.

1. For instance, a cannon ball is launched directly upward from the ground with an initial velocity of 320 feet per second. The acceleration due to gravity is 32 feet per second squared. The following equation models this situation.

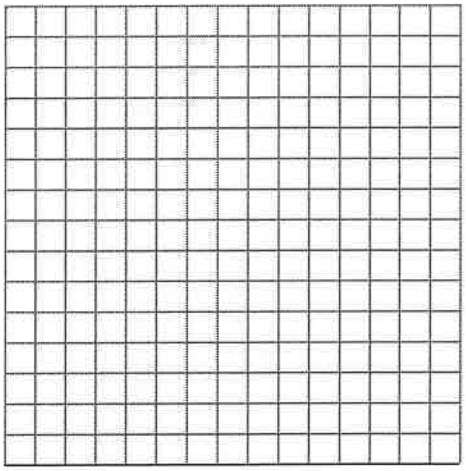
   a. Write an equation for vertical motion given the above information.

   b. How high will the cannon ball be after
      - 4 seconds
      - 10 seconds
      - 3.1 seconds
      - 20 seconds

   c. At what time(s) will the cannon ball be
      - 304 feet above the ground?
      - 576 feet above the ground?

   d. Using the information from Questions 2 and 3, complete the following table. Then use the information in the table to graph the height of the cannon ball versus the time. Is the graph linear? Explain

Time in seconds	Height in feet
4	
10	
20	
	304
	304
	576
	576



   e. From the graph, can you tell the maximum height that the cannon ball attains? [Think what point will it have its maximum height] If so, what is this height and after how many seconds does the cannon ball reach it?

General Strategies

- Read the problem entirely. Don't be afraid to re-read it until you understand.
- Determine what you are asked to find.
  - If it requires a maximum or minimum, then complete the square.
  - If it requires solving a quadratic equation, then factor or use the quadratic formula.
- Draw and label a diagram when applicable.
- Define all variables you introduce.
- Look at your answer and ask yourself: "Is this answer possible?" You may find that your answer is not possible because it does not fit with the facts presented in the problem.
- Finish your solution with a concluding statement.

Practice:

1. A football is punted into the air. Its height *h*, in meters, after *t* seconds is given by the equation: $h = -4.9t^2 + 24.5t + 1$

   a. First draw a sketch of the information in the problem.

   b. How high is the ball after 1 second?

   c. Find the maximum height of the ball to one decimal place.

   d. When does the ball reach its maximum height?

   e. When does the ball hit the ground?

2. Jason jumped off of a cliff into the ocean in Acapulco while vacationing with some friends. His height as a function of time could be modeled by the function $h = -16t^2 + 16t + 480$ where *t* is the time in seconds and *h* is the height in feet.

   a. First draw a sketch of the information in the problem.

   b. How long did it take for Jason to reach his maximum height?

   c. What was the highest point that Jason reached?

   d. Jason hit the water after how many seconds?

3. A model rocket is launched from the roof of a building. Its flight path is modeled by $h = -5t^2 + 30t + 10$ Where *h* is the height of the rocket above the ground in meters and *t* is the time after the launch in seconds.

   a. First draw a sketch of the information in the problem.

   b. What is the rocket's maximum height?

   c. How many seconds did it take for the rocket to reach its maximum height?

   d. How long before it hit the ground?

Homework

1. Eric is at the top of a cliff that is 500 feet from the ocean's surface. He is waiting for his friends to climb up and meet him. As he waits he decides to start casually tossing pebbles off the side of the cliff. The equation that represents the height of his pebble tosses is $s = -t^2 + 5t + 500$, where s = distance in feet and t = time in seconds.
   a. How long does it take the pebble to hit the water?
   b. If fifteen seconds have gone by, what is the height of the pebble from the ocean?
   c. What is the highest point the pebble will go?

2. Devin is practicing golf at the driving range. The equation that represents the height of his ball is $s = -0.5t^2 + 12t$, where s = distance in feet and t = time in seconds.
   a. What is the highest his ball will ever go?
   b. If the ball is 31.5 feet in the air, how many seconds have gone by?
   c. How long will it take the ball to hit the ground?

3. Jack throws a ball up in the air to see how high he can get it to go. The equation that represents the height of the ball is $s = -2t^2 + 20t$, where s = distance in feet and t = time in seconds.
   a. How high will the ball be at 7 seconds?
   b. If the ball is 48 feet in the air, how many seconds have gone by?
   c. How long does it take for the ball to go up and come back down to the ground?

4. Alicia is jumping on her super trampoline, getting as high as she possible can. The equation to represent her height is $s = -5t^2 + 20t$, where s = distance in feet and t = time in seconds.
   a. What is the highest Alicia can jump on her trampoline?
   b. How high will Alicia be at 4 seconds?
   c. If Alicia is 18.75 feet in the air, how many seconds have gone by?

5. Brenden is tossing a ball in the air. He knows the height of the ball is represented by $s = -12t^2 + 50t$, where s is the height and t is the time.
   a. How high (in feet) will the ball be after 4 seconds?
   b. How high (in feet) will the ball be after 1.5 seconds?
   c. How long (in seconds) was the ball in the air before it came back down to the ground?

6. An object is moving in a straight line. It initially travels at a speed of 6 meters per second, and it speeds up at a constant acceleration of 4 meters per second each second. The distance d, in meters, that this object travels is given by the equation $d = 2t^2 + 6t$, where t is in seconds. According to this equation, how long will it take the object to travel 108 meters.

7. The entrance to an athletic field is in the shape of a parabolic archway. The archway is modeled by the equation $d = 12x - x^2$, where d represents the distance, in feet, that the arch is above the ground for any x value.
   a. For what values of x will the arch be 20 feet above the ground?
   b. How many feet wide is the base of the arch?
   c. What is the maximum height of the arch above the ground?

8. A rocket is shot upward with an initial velocity of 40 feet per second. Its height above the ground after t seconds is given by $h(t) = 40t - 16t^2$.
   a. What is its maximum height?
   b. When will it return to earth?

9. If a toy rocket is launched vertically upward from ground level with an initial velocity of 128 feet per second, then its height *h* after *t* seconds is given by the equation $h(t) = -16t^2 + 128t$ (if air resistance is neglected).
   a. How long will it take for the rocket to return to the ground?
   b. After how many seconds will the rocket be 112 feet above the ground?
   c. How long will it take the rocket to hit its maximum height?

Standard(s):

- **A.SSE.1** Interpret expressions that represent a quantity in terms of its context.
- **A.CED.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- **A.CED.2** Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- **A.CED.4** Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.

Essential Question(s): How do you write the formulas for quadratic equations?

When solving word problems, generally you should first read the entire problem and don't be afraid to re-read until you understand. Next you should determine what you are asked to find. In this lesson you are being asked to solve the quadratic equation, by factoring or use of the quadratic formula. You should then consider drawing and labeling a diagram if it is possible making sure to define all the variables that are introduced. Finally after finding the answers decide if the answers fit the problem situation and then write a concluding statement.

Numeric Operations Problems

1. The sum of the squares of two consecutive integers is 365. What are the integers?

2. Find two consecutive odd numbers whose product is 99?

Shapes and Borders Problems

3. The width of a rectangular painting is 5 inches shorter than the length
   a. Write algebraic expressions to represent the width and the length of the painting.

   b. Write an equation to model the area of the painting given that the area is 300 in^2.

   c. Solve the quadratic equation. What do the x-intercepts mean in respect to the problem situation?

4. The length of a rectangular field is 2 m greater than three times its width. The area of the field is 1496 m^2. What are the dimensions of the field?

5. The length of the hypotenuse of a right triangle is 5 cm. Find the lengths of the two sides if one side is 1 cm longer than the other.

6. A rectangular garden measures 15 m by 24 m. A larger garden is to be made by increasing each side length by the same amount. The resulting area is to be 1.5 times the original area. Find the dimensions of the new garden to the nearest tenth of a meter.

HOMEWORK

1. A rectangular lawn measuring 8 m by 4 m is surrounded by a flower bed of uniform width. The combined area of the lawn and the flower bed is 165 m^2. What is the width of the flower bed?

2. One side of a right triangle is 2 cm shorter than the hypotenuse and 7 cm longer than the third side. Find the lengths of the sides of the triangle.

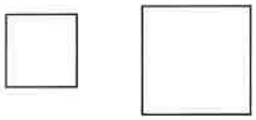
3. The sum of the squares of two consecutive even integers is 452. Find the integers.

4. The product of two consecutive integers is 30. Find the integers.

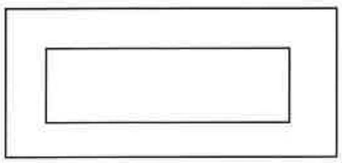
5. Find three consecutive positive odd integers such that the product of the first and third is 4 less than 7 times the second.

6. The product of two consecutive negative even integers is 24. Find the integers.

7. In the two squares shown below, the larger square has a side length 1 foot greater than that of the smaller square. If the combined area of the two squares is 113 square feet, find the length of the side of the smaller square.



8. As illustrated below, a frame for a picture is 2½ inches wide. The picture enclosed by the frame is 5 inches longer than it is wide. If the area of the picture itself is 300 square inches, determine the outer dimensions of the frame.



9. The square of a positive number increased by 4 times the number is equal to 140. Find the number.

10. Find three consecutive positive odd integers such that the product of the first and third is equal to 1 less than twice the second.