Section 1.5 Guided Notebook

Section 1.5 Applications of Quadratic Equations

- Work through Objective 1
- Work through Objective 2
- Work through Objective 3
- Work through Objective 4
- Work through Objective 5

Section 1.5 Applications of Quadratic Equations

Write down the **Four-Step Strategy for Problem Solving.**

Section 1.5 Objective 1 Solving Applications Involving Unknown Numeric Quantities

Answer the following question for Example 1.

The product of a number and 1 more than twice the number is 36. Find the two numbers.

Explain why the other number is represented by $2x + 1$

Explain why the equation is $x(2x + 1) = 36$.

Show all steps to solve the equation below.

Show the steps to substitute $-\frac{9}{2}$ for x in $2x + 1$.

What is the answer to the question in Example 1?

Section 1.5 Objective 2 Using the Projectile Motion Model

What is the projectile motion model seen in this objective?

Work through the video that accompanies Example 2 and take notes here:

A toy rocket is launched at an initial velocity of 14.7 m/s from a 49-m tall platform. The height h of the object at any time t seconds after launch is given by the equation $h = -4.9t^2 + 14.7t + 49$. When will the rocket hit the ground?

Another model used to describe projectile motion (where the height is in feet and time is in seconds) is given by $h = -16t^2 + v_0t + h_0$ (where v_0 is the initial velocity and h_0 is initial height above the ground).

Section 1.5 Objective 3 Solving Geometric Applications

Work through the interactive video that accompanies Example 3 and write your notes here:
The length of a rectangle is 6 in. less than four times the width. Find the dimensions of the rectangle if the area of the rectangle is 54 in^2.

Work through the video that accompanies Example 4 and take notes here:
Jimmy bought a new 40 in. high-definition television. If the length of Jimmy's television is 8 in. longer than the width, find the width of the television. (Remember the Pythagorean Theorem: $a^2 + b^2 = c^2$)

Section 1.5 Objective 4: Solving Applications Involving Uniform Motion

What is the relationship between distance, rate, and time?

Section 1.5

Work through the video with Example 5 showing all work below.

Kevin flew his new Cessna O-2A airplane from Jonesburg to Mountainview, a distance of 2,560 miles. The average speed for the return trip was 64 mph faster than the average outbound speed. If the total flying time for the round trip was 18 hours, what was the plane's average speed on the outbound trip from Jonesburg to Mountainview?

Draw a picture representing the trip from Jonesburg and back.

According to the video, what does r represent?

Draw the table that is in the video and complete it.

Why does the return trip have a rate of $r + 64$?

Explain the expressions that represent each amount of time in the table.

Explain the equation that is to be solved in the video.

Show all steps to solve the equation.

Answer the question for Example 5.

Section 1.5 Objective 5: Solving Applications Involving Rates of Work

Write down the formula that is used when dealing with a word problem that involves two workers that are performing a job (or task).

What does t_1, t_1 , and t represent in the formula?

Work through the video with Example 6 and show all work below.

Dawn can finish the monthly sales reports in 2 hours less time than it takes Adam. Working together, they were able to finish the sales reports in 8 hours. How long does it take each person to finish the monthly sales reports alone? (Round to the nearest minute.)

According to the video, what does t represent?

Why is t – 2 Dawn's time?

Draw and complete the table shown in the video.

Explain the equation in the video.

Solve this equation below, showing all steps.

Answer the question in Example 6.