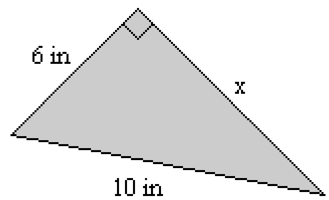
Review Exercise Set 7

Exercise 1: The product of two consecutive positive odd integers is 35. Determine the two integers.

Exercise 2: The product of two positive integers is 36. Determine the integers if the larger integer is 1 more than twice the smaller integer.

Exercise 3: The area of a rectangle is 300 square feet. Determine the length and width of the rectangle if the length is 5 feet greater than the width. (Hint: the area of a rectangle is the product of the length and width)

Exercise 4: Using the diagram below, solve for the unknown side.



Exercise 5: The length of a pool is 7 feet greater than the width of the pool. A diagonal across the pool is 8 feet greater than the width of the pool. Find the length of the diagonal across the pool.

Review Exercise Set 7 Answer Key

Exercise 1: The product of two consecutive positive odd integers is 35. Determine the two integers.

Assign variable expressions to the two integers

x = first consecutive positive odd integer
$x + 2$ = second consecutive positive odd integer

Setup the equation

$x(x + 2) = 35$

Solve for x

$x^2 + 2x = 35$
$x^2 + 2x - 35 = 0$
$(x + 7)(x - 5) = 0$

$x + 7 = 0$ or $x - 5 = 0$
$x = -7$ or $x = 5$

Since we were told that the integers must be positive $x = -7$ cannot be a solution for this problem. Therefore, x will be 5.

$x + 2 = 5 + 2 = 7$

The two consecutive positive odd integers are 5 and 7.

Exercise 2: The product of two positive integers is 36. Determine the integers if the larger integer is 1 more than twice the smaller integer.

Assign variable expressions to the two integers

x = smaller positive integer
$2x + 1$ = larger positive integer

Setup the equation

$x(2x + 1) = 36$

Solve for x

$x(2x + 1) = 36$
$2x^2 + x = 36$
$2x^2 + x - 36 = 0$

$(2x + 9)(x - 4) = 0$

$2x + 9 = 0$ or $x - 4 = 0$
$2x = -9$ or $x = 4$
$x = -\frac{9}{2}$ or $x = 4$

The only possible answer is $x = 4$ because $-\frac{9}{2}$ is not positive and it is not an integer.

$2x + 1 = 2(4) + 1 = 8 + 1 = 9$

The two positive integers are 4 and 9.

Exercise 3: The area of a rectangle is 300 square feet. Determine the length and width of the rectangle if the length is 5 feet greater than the width. (Hint: the area of a rectangle is the product of the length and width)

Assign variable expressions to the dimensions of the rectangle

x = width
$x + 5$ = length

Setup the equation

$x(x + 5) = 300$

Solve for x

$x(x + 5) = 300$
$x^2 + 5x = 300$
$x^2 + 5x - 300 = 0$
$(x + 20)(x - 15) = 0$

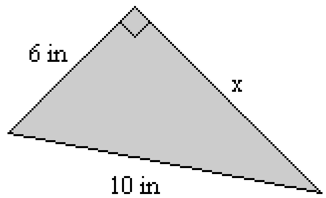
$x + 20 = 0$ or $x - 15 = 0$
$x = -20$ or $x = 15$

The variable x represents the width of the pool and cannot be a negative measurement. Therefore, $x = 15$ is our solution to the equation.

$x + 5 = 15 + 5 = 20$

The measurements of the pool are 15 feet for the width and 20 feet for the length.

Exercise 4: Using the diagram below, solve for the unknown side.



Since the triangle is a right triangle we can use the Pythagorean Theorem to solve for the unknown side.

$a^2 + b^2 = c^2$

Let x equal one of the legs of the triangle

$x = b$

Substitute in the known values, for a and c, and then solve for x

$a^2 + b^2 = c^2$
$(6)^2 + x^2 = (10)^2$
$36 + x^2 = 100$
$36 + x^2 - 100 = 0$
$x^2 - 64 = 0$
$(x - 8)(x + 8) = 0$

$x - 8 = 0$ or $x + 8 = 0$
$x = 8$ or $x = -8$

Since we are dealing with a measurement, the answer must be positive. So $x = 8$ is our solution.

The length of the unknown side is 8 inches.

Exercise 5: The length of a pool is 7 feet greater than the width of the pool. A diagonal across the pool is 8 feet greater than the width of the pool. Find the length of the diagonal across the pool.

Assign variable expressions to the dimensions of the rectangle

x = width
$x + 7$ = length
$x + 8$ = diagonal

Setup the equation

The width, length, and diagonal of the pool would form a right triangle so we can use the Pythagorean Theorem to setup the equation.

$a^2 + b^2 = c^2$
$(x)^2 + (x + 7)^2 = (x + 8)^2$

Solve for x

$(x)^2 + (x + 7)^2 = (x + 8)^2$
$x^2 + x^2 + 7x + 7x + 49 = x^2 + 8x + 8x + 64$
$2x^2 + 14x + 49 = x^2 + 16x + 64$
$2x^2 - x^2 + 14x - 16x + 49 - 64 = 0$
$x^2 - 2x - 15 = 0$
$(x - 5)(x + 3) = 0$

$x - 5 = 0$ or $x + 3 = 0$
$x = 5$ or $x = -3$

The measurements of the pool cannot be negative, so $x = 5$.

$x + 7 = 5 + 7 = 12$

The length of the pool is 12 feet.