

Name: \_\_\_\_\_

Points: \_\_\_\_\_

1. The **standard form of a quadratic equation** is \_\_\_\_\_

2. List the possible methods that a quadratic equation can be solved:

\_\_\_\_\_

\_\_\_\_\_

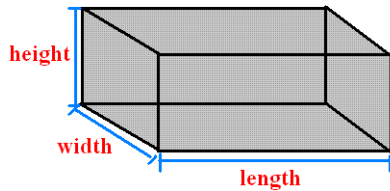
\_\_\_\_\_

\_\_\_\_\_

3. A corner shelf is to be made from a triangular piece of marble. Find the distance  $x$  that the shelf will extend along the wall. Assume the walls are at right angles. Round the answer to the nearest inches.

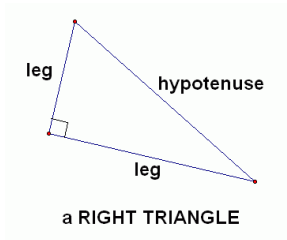


4. The volume of a rectangular box is  $64 \text{ cm}^3$ . If the width is 9 times longer than the height and the length is 3 times longer than the height, find the dimensions of the box. [ $volume = (length)(width)(height)$ ]



Schwartzman (1994) defines **Quadratic**: “From the Latin ‘quadratum’, ‘square’, from the Indo-European root k<sup>w</sup>etwer – ‘four’ to ancient Romans. The name square was literally a description of the figure as ‘four sided.’ The Romans following the Greek model, conceived of the abstract quantity  $s^2$  as the area of a square sides, that’s why something raised to the second power is said to be squared using the English word quadratic.”

5. The length of one leg of a right triangle is 1 meter more than twice the length of the other leg. The hypotenuse measures 8 meters. Find the lengths of the legs. Round to the nearest tenth.



6. Solve the following equations by completing the square:

a.  $2b^2 - 12b = 5$

b.  $6k^2 + 17k + 5 = 0$

**Practical Use of the Quadratic Equation**

Where there is a problem with unknown values, a formula is set up to help find the unknown values. Such problems can often be found in word problems. The setting up of a formula is called a “quadratic equation.” It is believed that the Babylonian civilization of the second millennium B.C. (McLiesh, 1991) was the first to use worded quadratic problems, undoubtedly to solve practical problems.

Many of the principles used in solving word problems were introduced by practitioners of the law, those we would call lawyers today, who defended the interests of their kin against claims by other claimants (Cooke, 1997). To explain how they derived their claims on behalf of their clients, mathematical formulas were used, and these were written out, without the use of mathematical symbols.

Among the early scholars of a center of learning in the City of Baghdad, around 800 A.D., known as the House of Wisdom, was a mathematician and astronomer from the territory known today as Uzbekistan. His name was Muhammed ibn Musa Al-Khwarizmi, (Muhammed, Son of Moses, from Khorezm) (Cooke, 1997). Al-Khwarizmi was known for his work in algebra which can be found in his book with the Arabic title “Kitab fi al-jabr wal-muqabala.” In the preface of this book, Al-Khwarizimi states that his work is intended to be for practical use, what might today be called applied mathematics.

7. Solve

a.  $p(p - 6) = -14$

b.  $\frac{1}{5}y^2 + y + \frac{3}{5} = 0$  (Hint: Clear fractions first)

## References

Cooke, R. (1997). *The history of mathematics: a brief course*. New York, NY: John Wiley and Sons.

McLiesh, J (1991). *The history of numbers and how they shape lives*. New York, NY: Ballantine Books.

Swartzman, S. (1994). *The words of mathematics: An etymological dictionary of mathematical terms used in English*. USA: The Mathematical Association of America.