Example of buried treasure by pythagorean theorem essay

Life

Abstract

Solving the problem of treasure map using Pythagorean Theorem is the main focus. The treasure is buried and finding it by saving the time of digging is the solution to the problem. Ahmed who have half of the treasure map if share with Vanessa then it becomes easy to finding the treasure. The theorem helps in finding the paces from the castle rock by applying the formula. The quadratic equations formed by using Pythagoras theorem and solving those equations we get the value of x. Buried Treasure By Pythagoras Theorem

Ahmed has half of a treasure map, which indicates that the treasure is buried in the desert 2x + 6 paces from Castle Rock. Vanessa has the other half of the map. Her half indicates that to find the treasure, one must get to Castle Rock, walk x paces to the north, and then walk 2x + 4 paces to the east. If they share their information, then they can find x and save a of digging. What is x ?

Solution

Even though Ahmed half of the map doesn’t indicate which direction the 2x + 6 paces should go, we can assume that his and Vanessa’s paces should end up in the same place. When we sketch this out on scratch paper we see that it forms a right triangle with 2x + 6 being the length of the hypotenuse, and x and 2x + 4 being the legs of the triangle. Now we know how we can use the Pythagorean Theorem to help solve for x.

Pythagoras theorem

The Pythagorean Theorem shows the mathematical relationship between the sides of right angled triangle. A right angle triangle has one right internal angle and states that if the length of the smallest side are squared and their sum i. e. equal to the square of the longest side (the hypotenuse). So algebraically, right angled triangle with legs of length a and b and hypotenuse c, these lengths have the relationship of .

Let a = x, and b = 2x + 4, so that c = 2x + 6.

Then, by putting these measurements into the Theorem equation we have

$x^2 + (2x + 4)^2 = (2x + 6)^2$ The binomials into the Pythagorean Theorem.

$x^2 + 4x^2 + 16x + 16 = 4x^2 + 24x + 36$ The binomials are squared.

Notice there is a $4x^2$ on both sides of the equation which can be $-4x^2$, $-4x^2$ subtracted out first.

$x^2 + 16x + 16 = 24x + 36$ Subtract 36x from both sides of equation. -36x, -36x

$x^2 – 8x + 16 = 36$ Subtract 81 from both sides of equation. -81, -81

$x^2 – 8x – 20 = 0$ Now we have a quadratic equation to solve by factoring and using the zero factor.

(x –) (x +) = 0

Since the coefficient of x^2 is 1 we can start with a pair of parenthesis with an x in each.

Since the 20 is negative we know there will be one + and one – in the binomials.

We need two factors of -20 which add up to -8.

-1, 20; -2, 10; -4, 5

1, -20; 2, -10; 4, -5.

Looks like 2, -10 will do it!

(x – 10)(x + 2) = 0 Use the zero factor property to solve each binomial,

x – 10 = 0 or x + 2 = 0 creating a compound equation.

x = 10 or x = -2 These are the possible solutions to our equation.

However, one of these solutions is what we call extraneous because it doesn’t work with this scenario at all. You cannot have negative paces or negative distance in a measured geometric figure, so the -2 solution does not work, leaving us with x = 10 as the key number of paces.

The treasure lies 10 paces north and 2x + 4 = 2(10) + 4 = 24 paces east of Castle Rock, or 2x + 6 = 2(10) + 6 = 26 paces straight from the Castle rock!

As we have come to know that Pythagorean theorem it works for any right angled triangle and have many applications in real life. As we have come to know that Pythagorean theorem it works for any right angled triangle and have many applications in real life. GPS systems also uses this theorem . In ‘ howstuffworks. com’ we have seen that there are examples of circles intersecting each other to determine the exact location in 2-dimension while in 3-dimension the same is done with spheres. But there is another way out to find the location if someone is lost. From the three positions mentioned we can form three equations with distance expression and can use the Pythagoras theorem to solve the problem. GPS systems also uses Pythagorean theorem on the surface of the earth by forming right angle triangle to calculate locations. This method is also used by car navigation. In

cities there are many blocks laid out in 90 degrees. The distance between two points on different streets are easily solved by applying this theorem.

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2x+4

x 2x+6

Castle Rock

Figure1. It shows the right angled triangle

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References

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- Appendix

Each Appendix appears on its own page.

Footnotes

1Complete APA style formatting information may be found in the Publication Manual.

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