

Algebra II

4-8

Word Problems

Nov 13-8:52 AM

Solve. (pg 199)

- 1) The sum of a number and its square is 72.
Find the number.

Let $x =$ the number -9 or 8

$$x + x^2 = 72$$

$$x^2 + x - 72 = 0$$

$$(x + 9)(x - 8) = 0$$

$$\{-9, 8\}$$

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11) The hypotenuse of a right triangle is 25m long.
The length of one leg is 10 m less than twice the other. Find the length of each leg.

Let $x = 1^{\text{st}}$ leg $\begin{array}{|c|} \hline 15\text{m} \\ \hline \end{array}$

$2x - 10 = 2^{\text{nd}}$ $\begin{array}{|c|} \hline 20\text{m} \\ \hline \end{array}$

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

$(2x - 10)^2 + x^2 = 25^2$

$(2x - 10)(2x - 10) + x^2 = 25^2$

$4x^2 - 40x + 100 + x^2 = 625$

$5x^2 - 40x - 525 = 0$

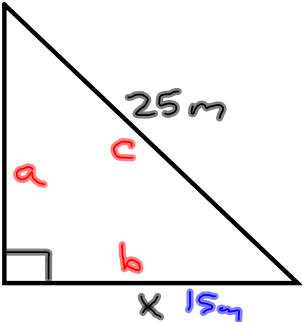
$\frac{5x^2}{5} - \frac{40x}{5} - \frac{525}{5} = \frac{0}{5}$

$x^2 - 8x - 105 = 0$

$(x + 7)(x - 15) = 0$ $\{ \cancel{x = -7}, 15 \}$

$x + 7 = 0$ $x - 15 = 0$

105
5, 21
35, 3
15, 7



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

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Free Fall Formulas

feet \rightarrow

$$h = vt - 16t^2$$

$h =$ height

$v =$ initial velocity

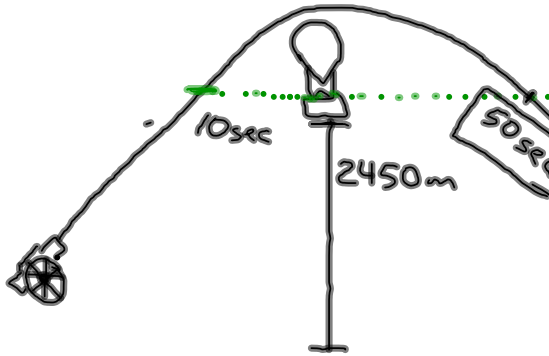
$t =$ time in seconds

↑
meters

$$h = vt - 4.9t^2$$

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- 17) A signal flare is fired upward from ground level with an initial speed of 294 m/sec. A balloonist cruising at a height of 2450 m sees it pass on the way up. How long will it be before the flare passes the balloonist on the way down?



$$h = vt - 4.9t^2$$

$$h = 294t - 4.9t^2$$

$$2450 = 294t - 4.9t^2$$

$$\frac{4.9t^2}{4.9} - \frac{294t}{4.9} + \frac{2450}{4.9} = \frac{0}{4.9}$$

$$t^2 - 60t + 500 = 0$$

$$(t - 10)(t - 50) = 0$$

$$\{10, 50\}$$

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2-30 even
(skip 26)

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