5.2 Intro to Solving Quadratic Eqs

Obj: 1. Solve quadratics by taking square roots.

2. Use pythagorean thm to solve problems. $a^2+b^2=c^2$ right $\triangle$.

$\sqrt{x^2}=\sqrt{a}$

$x=\pm\sqrt{a}$

$\sqrt{x^2}=\sqrt{9}$

$x=\pm 3$

$3^2=9$ ✓

$(-3)^2=9$ ✓

Nov 6-10:35 AM

Properties

1. Product Prop. of Square Roots:

$$\sqrt{ab}=\sqrt{a}\cdot\sqrt{b}$$

$$\sqrt{24}=\sqrt{4\cdot 6}=\sqrt{4}\cdot\sqrt{6}=2\sqrt{6}$$

2. Quotient Prop. of Sq. Roots:

$$\sqrt{\frac{a}{b}}=\frac{\sqrt{a}}{\sqrt{b}}$$

$$\sqrt{\frac{25}{16}}=\frac{\sqrt{25}}{\sqrt{16}}=\frac{5}{4}$$

Nov 6-11:08 AM

$\sqrt{32}$

$\sqrt{16 \cdot 2}$

$4\sqrt{2}$

or

$\sqrt{4 \cdot 8}$

$2\sqrt{8}$

$2\sqrt{4 \cdot 2}$

$2 \cdot 2\sqrt{2}$

$4\sqrt{2}$

$\sqrt{\frac{49}{121}}$

$= \frac{\sqrt{49}}{\sqrt{121}}$

$= \frac{7}{11}$

Nov 6-11:11 AM

Solve. Give exact & approximate answers:

$4x^2 + 13 = 253$

$-13 \quad -13$

$\frac{4x^2}{4} = \frac{240}{4}$

$\sqrt{x^2} = \sqrt{60}$

$x = \pm\sqrt{60}$

$x = \pm\sqrt{4 \cdot 15}$

$= \pm 2\sqrt{15}$ exact

approx

$x \approx \pm 7.75$

Nov 6-11:14 AM

Solve $5x^2 - 19 = 231$ Give exact & approx.

$+19 \quad +19$

$\frac{5x^2}{5} = \frac{250}{5}$

$\sqrt{x^2} = \sqrt{50}$

$x = \pm\sqrt{50}$

$x = \pm\sqrt{25 \cdot 2}$

$= \pm 5\sqrt{2}$ exact $\approx \pm 7.07$ approx.

Nov 6-11:17 AM

$\frac{9(x-2)^2}{9} = \frac{121}{9}$

$\sqrt{(x-2)^2} = \frac{121}{9}$

$x - 2 = \pm\sqrt{\frac{121}{9}}$

$+2 \quad +2$

$x = 2 \pm \frac{11}{3}$

$x = 2 + \frac{11}{3}$ $\qquad$ $x = 2 - \frac{11}{3}$

$\frac{6}{3} + \frac{11}{3}$ $\qquad$ $\frac{6}{3} - \frac{11}{3}$

$x = \frac{17}{3}$ $\qquad$ $x = \frac{-5}{3}$

Nov 6-11:21 AM

$\frac{4(x+2)^2}{4} = \frac{49}{4}$

$\sqrt{(x+2)^2} = \sqrt{\frac{49}{4}}$

$x+2 = \pm\frac{7}{2}$

$-2 \quad -2$

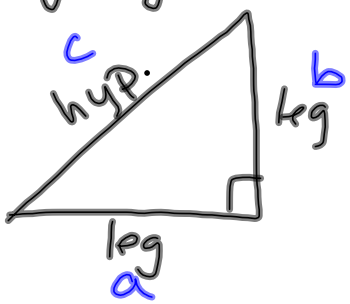
$x = -2 \pm \frac{7}{2}$

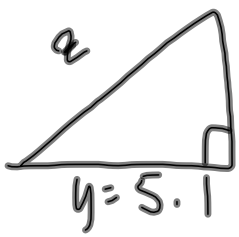
$x = -2 + \frac{7}{2} = -\frac{4}{2} + \frac{7}{2} = \frac{3}{2}$

$x = -2 - \frac{7}{2} = -\frac{4}{2} - \frac{7}{2} = -\frac{11}{2}$

Nov 6-11:24 AM

Pythagorean Thm: $a^2 + b^2 = c^2$



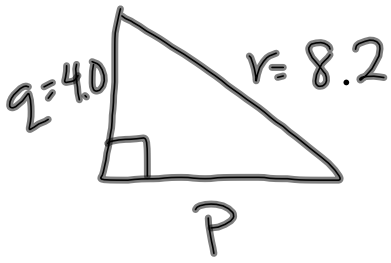


$2.5^2 + 5.1^2 = z^2$

$\sqrt{32.26} = \sqrt{z^2}$

$z \approx 5.68$

Nov 6-11:28 AM



$4.0^2 + p^2 = 8.2^2$

$16 + p^2 = 67.24$

$-16 \quad -16$

$\sqrt{p^2} = \sqrt{51.24}$

$p \approx 7.16$

Nov 6-11:31 AM