3.4 Operations with Radicals $\sqrt{}$

Mar 13

$\sqrt{8} = \sqrt{4 \times 2} = \sqrt{4}\,\sqrt{2} = 2\sqrt{2}$

$\sqrt{27} = \sqrt{9 \times 3} = 3\sqrt{3}$

$\sqrt{72} = \sqrt{36 \times 2} = 6\sqrt{2}$

$\sqrt{50} = \sqrt{25 \times 2} = 5\sqrt{2}$

Simplify

$-4\sqrt{6} \times 2\sqrt{6}$

$= -8\sqrt{36}$

$= -8(6)$

$= -48$

$3\sqrt{14} \times 5\sqrt{7}$

$= 15\sqrt{98}$

$= 15\sqrt{49 \times 2}$

$= 15(7)\sqrt{2}$

$= 105\sqrt{2}$

Simplify

$3\sqrt{2}-2\sqrt{5}+\sqrt{8}-\sqrt{20}$

$= 3\sqrt{2}-2\sqrt{5}+\sqrt{4\times 2}-\sqrt{4\times 5}$

$= 3\sqrt{2}-2\sqrt{5}+2\sqrt{2}-2\sqrt{5}$

$= 5\sqrt{2}-4\sqrt{5}$

$\left(3\sqrt{2}-4\sqrt{3}\right)^2$

$= \left(3\sqrt{2}\right)^2 - 2(3\sqrt{2})(4\sqrt{3}) + \left(4\sqrt{3}\right)^2$

$= 9(2) - 24\sqrt{6} + 16(3)$

$= 18 - 24\sqrt{6} + 48$

$= 66 - 24\sqrt{6}$

Determine the zeros of the following quadratic in exact simplified form. $f(x) = 3x^2 - 2x - 4$

$f(x) = 0$

$x = \dfrac{-b \pm \sqrt{b^2-4ac}}{2a}$

$x = \dfrac{2 \pm \sqrt{2^2-4(3)(-4)}}{2(3)}$

$x = \dfrac{2 \pm \sqrt{52}}{6}$

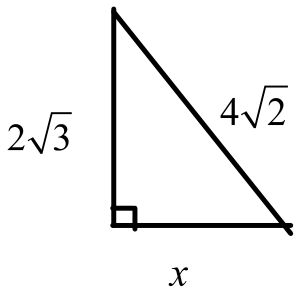
$\sqrt{52} = \sqrt{4\times 13}$

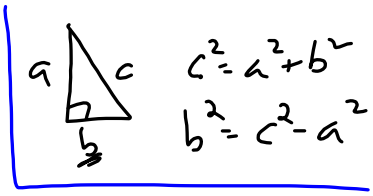
$\sqrt{52} = 2\sqrt{13}$

$x = \dfrac{2 \pm 2\sqrt{13}}{6}$

$x = \dfrac{2(1 \pm \sqrt{13})}{6_3} = \dfrac{1 \pm \sqrt{13}}{3}$

Determine the length of the missing side in exact simplified form.





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

$b^2 = c^2 - a^2$

$x^2 = (4\sqrt{2})^2 - (2\sqrt{3})^2$

$x^2 = 16(2) - 4(3)$

$x^2 = 20$

$x = \pm\sqrt{20}$, but $x > 0$

$x = \sqrt{20} = \sqrt{4\times 5} = 2\sqrt{5}$

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