Radical Functions

$$f(x)=\sqrt{x}$$

The square root function

Other radical functions:

$\sqrt{4} = \pm 2$

$\sqrt{8} = \pm 2\sqrt{2}$

$\sqrt{4 \cdot 2}$

$\sqrt{2 \cdot 2} \cdot 2$

$2\sqrt{2}$

$f(x) = \sqrt[3]{x}$

The cube root function

$\sqrt[3]{8} = 2$

$\sqrt[3]{4 \cdot 2}$

$\sqrt[3]{2 \cdot 2 \cdot 2} = 2$

$f(x) = \sqrt[4]{x}$

The fourth root function

$\sqrt[3]{16} = \sqrt[3]{2 \cdot 2 \cdot 2 \cdot 2}$

$2\sqrt[3]{2}$

This unit we will solve equations using roots and graph radical functions

Let's first remember how to work with radicals

Simplifying radicals

$\sqrt{8} = 2\sqrt{2}$

$\sqrt{4 \cdot 2}$

$\sqrt{2 \cdot 2 \cdot 2}$

$2\sqrt{2}$

$\sqrt{12} = 2\sqrt{3}$

$\sqrt{4 \cdot 3}$

$\sqrt{2 \cdot 2 \cdot 3}$

You try:

$3\sqrt{180} = 3 \cdot 3 \cdot 2\sqrt{5}$

$18\sqrt{5}$

$\sqrt{20}$

$\sqrt{5 \cdot 4}$

$\sqrt{5 \cdot 2 \cdot 2}$

$2\sqrt{5}$

$\sqrt{40}$

$\sqrt{8 \cdot 5}$

$\sqrt{4 \cdot 2 \cdot 5}$

$\sqrt{2 \cdot 2 \cdot 2 \cdot 5}$

$2\sqrt{2 \cdot 5}$

$2\sqrt{10}$

$\sqrt{180}$

$\sqrt{90 \cdot 2}$

$\sqrt{30 \cdot 3 \cdot 2}$

$\sqrt{3 \cdot 10 \cdot 3 \cdot 2}$

$\sqrt{3 \cdot 5 \cdot 2 \cdot 3 \cdot 2}$

$3 \cdot 2\sqrt{5}$

$6\sqrt{5}$

Adding and subtracting with radicals

$$\sqrt{8}+\sqrt{50}=7\sqrt{2}$$

$\sqrt{50}$

$\sqrt{5 \cdot 10}$

$\sqrt{5 \cdot 5 \cdot 2}$

$5\sqrt{2}$

$2(\sqrt{2}) + 5(\sqrt{2})$

$2x + 5x$

$= 7x$

You try:

$\sqrt{75} = 5\sqrt{3}$

$\sqrt{45} - \sqrt{12} = 3\sqrt{5} - 2\sqrt{3}$

$\sqrt{48} + \sqrt{12} =$

$= 4\sqrt{3} + 2\sqrt{3}$

$= 6\sqrt{3}$

Multiplying with Radicals

$1\sqrt{2} \cdot 1\sqrt{3} = \sqrt{6}$

$1\sqrt{6}$

$2\sqrt{5} \cdot 3\sqrt{5} = 30$

$6\sqrt{5 \cdot 5}$

$6\sqrt{25}$

$6\sqrt{5 \cdot 5}$

$6 \cdot 5$

30

$5\sqrt{8} \cdot 2\sqrt{40}$

$= 10\sqrt{8 \cdot 40}$

$10\sqrt{8 \cdot 8 \cdot 5}$

$10 \cdot 8\sqrt{5}$

$80\sqrt{5}$

You try:

$\sqrt{3} \cdot \sqrt{8}$

$\sqrt{3 \cdot 8}$

$\sqrt{3 \cdot 2 \cdot 4}$

$\sqrt{3 \cdot 2 \cdot 2 \cdot 2}$

$2\sqrt{6}$

$\sqrt{24}$

$3\sqrt{5} \cdot 4\sqrt{10}$

$12\sqrt{5 \cdot 10}$

$12\sqrt{5 \cdot 5 \cdot 2}$

$12 \cdot 5\sqrt{2}$

$60\sqrt{2}$

Homework:

Practice operations with Radicals