**MAT 012** **Lecture Notes, Ch 10, Suppl. A:** Introduction to Roots

*Example*: $x^2 = 49$ has two solutions

*Example*: Solve $x^2 = 121$

*Example*: Solve $x^2 = -16$

*Example*: Solve $x^3 = 64$

*Example*: Solve $x^3 = -8$

*Example*: Solve $x^4 = -81$

*Example*: Evaluate $\sqrt{\frac{144}{25}}$ =

*Example*: Evaluate $\sqrt{36}$ =

*Example*: Evaluate $\sqrt{0}$ =

*Example*: Evaluate $-\sqrt{81}$ = but $\sqrt{-81}$

*Example*: Evaluate $\sqrt{0.0025}$ =

*Example*: Evaluate $\sqrt[3]{-125}$ =

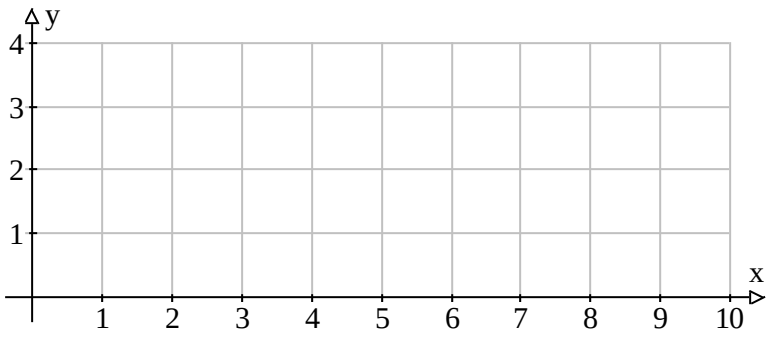
*Example*: Assuming that *x* is positive, simplify $\sqrt{16x^2}$ =

**Vocabulary**:
Square root, radical sign, radicand (expression under the radical sign), radical expression (includes a "$\sqrt{\ }$" somewhere), cube root (solves $x^3 = \#$), 4th-root (solves $x^4 = \#$), nth-root (solves $x^n = \#$)

**The square root function**

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

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




**Domain**:

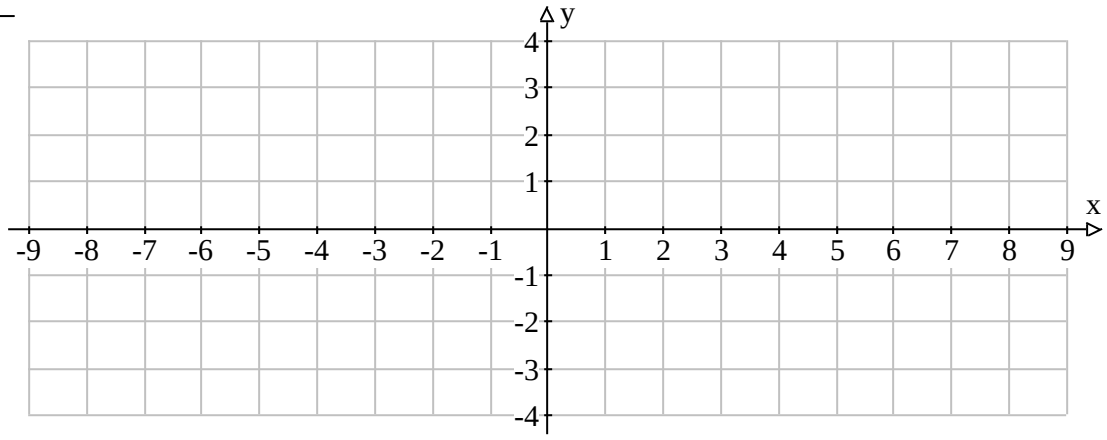
**Range**:

*Example*: Let $f(x) = \sqrt{2x+5}$ , evaluate $f(10)$

**The cube root function**

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

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




**Domain**:

**Range**:

*Example*: Let $f(x) = \sqrt[3]{12-5x}$ , evaluate $f(4)$