SQUARE AND CUBE ROOTS

1. The square tile below has an area of 324 square inches. What is the perimeter of the square tile? Show your work.

Area of square = 324 sq. in

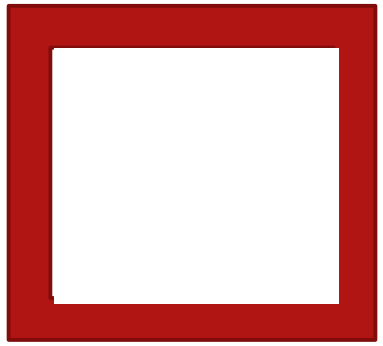
Area of square = s^2

Therefore $s^2 = 324$

$$\sqrt{s^2} = \sqrt{324}$$

$$s = 18$$

Length of each side =18 in



Square has 4 congruent sides

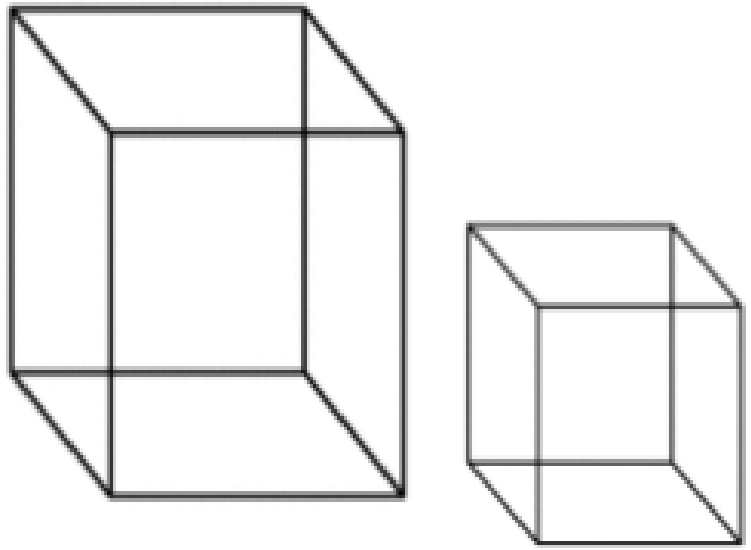
Perimeter of square = 4s

S = 18 in

Perimeter of square = 4(18) in

= 72 in

2. The volume of the large cube is 125 cubic inches. The volume of the small cube is 27 cubic inches. What is the difference between the length of one side of the large cube and the length of one side of the small cube? Show your work.



A cube is a three dimensional figure. That is, there is length, width(base), and height. The sides of a cube are congruent. Therefore length = width = height

Large Cube

Volume of cube = s^3

Volume of cube = 125 in^3

S^3 = 125 in^3

$\sqrt[3]{s^3} = \sqrt[3]{125}$

S = 5

The length of each side of the large cube = 5 in

Small Cube

Volume of cube = s^3

Volume of cube = 27 in^3

S^3 = 27 in^3

$\sqrt[3]{s^3} = \sqrt[3]{27}$

S = 3

The length of each side of the small cube = 3 in

The difference between the lengths of the side of the large cube and the small cube is (5 – 3) inches = 2 inches

Use square root and cube root symbols to represent the real solutions of each equation. Then evaluate any square roots of perfect squares and cube roots of perfect cubes. Indicate if any of your solutions are irrational.

1. $x^2 = 196$

1. $\sqrt{196}$ = 14
Rational

2. $x^3 = 64$

2. $\sqrt[3]{64}$ = 4
Rational

3. $48 = x^2$

3. $48 = x^2$

$\sqrt{48} = \sqrt{x^2}$

48 is not a perfect square, therefore the $\sqrt{48}$ does not terminate.

Use square root and cube root symbols to represent the real solutions of each equation. Then evaluate any square roots of perfect squares and cube roots of perfect cubes. Indicate if any of your solutions are irrational.

4. $27 = x^3$

$\sqrt[3]{27} = \sqrt[3]{x^3}$

3 = x

Rational

5. $x^3 = 36$

$\sqrt[3]{x^3} = \sqrt[3]{36}$

36 is not a perfect cube, therefore the cube root of 36 is irrational

Evaluate each of the following without using a calculator.

$\sqrt{121}$

11

$\sqrt[3]{512}$

8

$\frac{4}{\sqrt{9}}$ $\frac{4}{3}$

$\sqrt{\frac{4}{9}}$ $\frac{2}{3}$

$\frac{\sqrt{4}}{\sqrt{9}}$ $\frac{2}{3}$

$\sqrt[3]{\frac{1}{27}}$ $\frac{1}{3}$