

Applications of Radical Equations

Solve the following problems. Show your work.

- ① A cube has volume $v = s^3$, where 's' is the length of a side. Find the side of a cube with a volume of 6000 cm^3 .

- ② The difference between an integer and its square root is 12. What is the integer?

- ③ The sum of an integer and three times its square root is 40. Find the integer.

- ④ The time period 'T' (in seconds) of a pendulum is expressed by the equation $T = 2\pi\sqrt{\frac{L}{g}}$, where 'L' is the length of the pendulum and 'g' is the gravitational force (20 m/s^2).
 - a) Find the period of the pendulum if its length is i) 1.0 m, ii) 0.048 m
 - b) Write the equation with respect to 'L'.
 - c) If the period of the pendulum is 1s, how much is its length?

- ⑤ The formula for the speed of a falling object is $v = \sqrt{64d}$ where 'v' is the speed of the object in ft/s and 'd' is the distance the object has fallen, in ft. Find the distance the object has fallen if its speed is 150 ft/s.

Applications of Radical Equations

Answers

- ① A cube has volume $v = s^3$, where 's' is the length of a side. Find the side of a cube with a volume of 6000 cm^3 .

$$s = 10\sqrt[3]{6}, s = -5\sqrt[3]{6} + 5\sqrt[3]{2} \cdot 3\frac{5}{6}i, s = -5\sqrt[3]{6} - 5\sqrt[3]{2} \cdot 3\frac{5}{6}i$$

- ② The difference between an integer and its square root is 12. What is the integer?

16

- ③ The sum of an integer and three times its square root is 40. Find the integer.

25

- ④ The time period 'T' (in seconds) of a pendulum is expressed by the equation $T = 2\pi\sqrt{\frac{L}{g}}$, where 'L' is the length of the pendulum and 'g' is the gravitational force (20 m/s^2).
- a) Find the period of the pendulum if its length is i) 1.0 m, ii) 0.048 m
b) Write the equation with respect to 'L'.
c) If the period of the pendulum is 1s, how much is its length?

a) i) 1.405 s
ii) 0.307 s

$$b) L = \frac{T^2 G}{4\pi^2}$$

c) 0.506 m

- ⑤ The formula for the speed of a falling object is $v = \sqrt{64d}$ where 'v' is the speed of the object in ft/s and 'd' is the distance the object has fallen, in ft. Find the distance the object has fallen if its speed is 150 ft/s.

351.56 ft