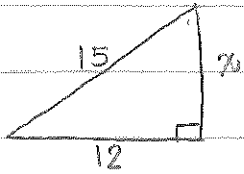


Radical Equations Application Problems

81.



$$x^2 + 12^2 = 15^2$$

$$x^2 + 144 = 225$$

$$\sqrt{x^2} = \sqrt{81}$$

$$x = \pm 9$$

length is 9

84.

$$4^2 + 6^2 = x^2$$

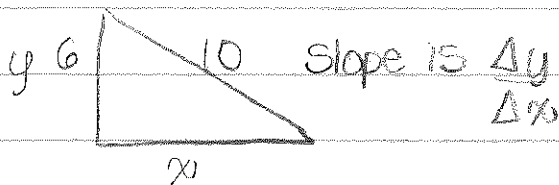
$$16 + 36 = x^2$$

$$\sqrt{52} = \sqrt{x^2}$$

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

Length is $2\sqrt{13}$

90.



$$x^2 + 6^2 = 10^2$$

$$x^2 = 64$$

$$x = \pm 8 \text{ length is } 8$$

$$\text{so } m = \frac{6}{8} = \frac{3}{4}$$

93.

$$s = \pi r \sqrt{r^2 + h^2}$$

$$\frac{s}{\pi r} = \sqrt{r^2 + h^2}$$

$$\left(\frac{s}{\pi r}\right)^2 = (r^2 + h^2)$$

$$\frac{s^2}{(\pi r)^2} = r^2 + h^2$$

$$\frac{s^2}{(\pi r)^2} - r^2 = h^2$$

$$h = \sqrt{\frac{s^2}{(\pi r)^2} - r^2}$$

$$h = \sqrt{\frac{(36\pi\sqrt{2})^2}{(\pi 14)^2} - 14^2}$$

$$h = \sqrt{\frac{132,496\cancel{\pi^2} \cdot 2}{\cancel{\pi^2} 196} - 196}$$

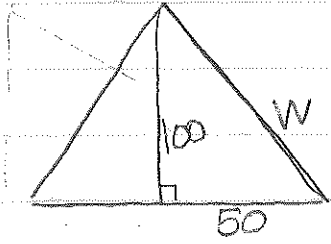
$$h = \sqrt{\frac{264,992}{196} - 196}$$

$$h = \sqrt{1352 - 196}$$

$$h = \sqrt{1156}$$

$$h = 34$$

88.



$$100^2 + 50^2 = W^2$$

$$10,000 + 2,500 = W^2$$

$$12,500 = W^2$$

96.

Formula for the volume of a sphere: $V = \frac{4}{3} \pi r^3$

$$\frac{V}{\frac{4}{3}\pi} = \frac{\frac{4}{3}\pi r^3}{\frac{4}{3}\pi} \rightarrow \frac{V}{\frac{4}{3}\pi} = r^3 \rightarrow \frac{3V}{4\pi} = r^3$$

$$r = \sqrt[3]{\frac{3V}{4\pi}}$$

97.

$$t = \sqrt{\frac{d}{16}}$$

$$t = 2 \text{ so}$$

$$2^2 = \left(\sqrt{\frac{d}{16}}\right)^2$$

$$4 = \frac{d}{16} \quad d = 64$$

64 feet

98.

$$t = \sqrt{\frac{d}{16}}$$

$$4.5^2 = \left(\sqrt{\frac{d}{16}}\right)^2$$

$$20.25 = \frac{d}{16} \quad d = 324$$

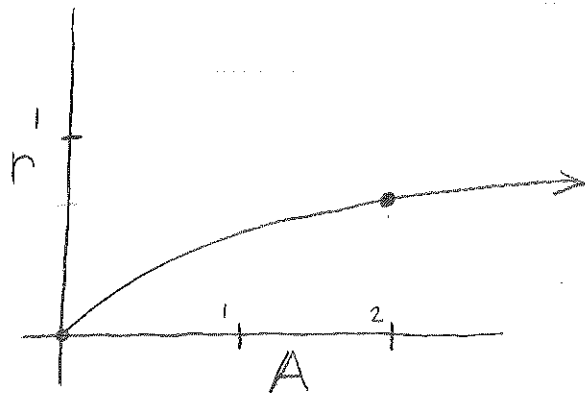
324 feet

95.

$$A = \pi r^2$$

$$\frac{A}{\pi} = r^2$$

$$r = \sqrt{\frac{A}{\pi}}$$



103. $t = 2\pi \sqrt{\frac{L}{32}}$ $L = \text{length (ft) of one cycle of a pendulum}$
 $t = \text{time (sec)}$

$$\frac{1.5}{2\pi} = \frac{2\pi \sqrt{\frac{L}{32}}}{2\pi} \rightarrow \sqrt{\frac{L}{32}} = \frac{1.5}{2\pi}$$

$$\left(\sqrt{\frac{L}{32}}\right)^2 = \left(\frac{1.5}{2\pi}\right)^2 \quad \frac{L}{32} = .06 \quad L = 1.92$$

Approx 1.92 ft

104. $.75 = 2\pi \sqrt{\frac{L}{32}}$

$$\left(\frac{.75}{2\pi}\right)^2 = \left(\sqrt{\frac{L}{32}}\right)^2$$

$$.014 = \frac{L}{32} \quad L = .46 \quad \text{Approx .46 ft}$$

