82. The 12-in. pizza is a better buy. A better buy gives you more area (more pepperoni) per dollar and the area of a pizza depends on the square of the diameter.

For the 12 in.: \[ \frac{\pi(6.0 \text{ in.})^2}{13.50} = \frac{8.4 \text{ in.}^2}{\text{dollar}} \]

For the 9.0 in.: \[ \frac{\pi(4.5 \text{ in.})^2}{7.95} = \frac{8.0 \text{ in.}^2}{\text{dollar}} \]

83. For the center circle: \[ A = \pi r^2 = \pi(0.64 \text{ cm})^2 = 1.3 \text{ cm}^2 \]

For the outer ring: \[ A = \pi[(1.78 \text{ cm})^2 - (1.66 \text{ cm})^2] = 1.3 \text{ cm}^2 \]

So same area for both if calculated to two significant figures.

84. \[ d = \sqrt{(90 \text{ ft})^2 + (90 \text{ ft})^2} = 127 \text{ ft} = (127 \text{ ft}) \times \frac{1 \text{ m}}{3.28 \text{ ft}} = 39 \text{ m} \]

85. \[ t = \frac{x}{v} = \frac{31 \text{ mi}}{75 \text{ mi/h}} = 0.41 \text{ h} = 25 \text{ min} \]

86. \[ 118 \text{ mi} = (118 \text{ mi}) \times \frac{1609 \text{ m}}{1 \text{ mi}} = 10^5 \text{ m} \]

307 mi = (307 mi) \times \frac{1609 \text{ m}}{1 \text{ mi}} = 10^5 \text{ m}.

279 ft = (279 ft) \times \frac{1 \text{ m}}{3.28 \text{ ft}} = 10^2 \text{ m}.

So \[ l = \text{LWD} = (10^5 \text{ m})(10^5 \text{ m})(10^3 \text{ m}) = 10^{13} \text{ m}^4 \]

87. \[ d = x \tan 30^\circ = (50 \text{ m} - x) \tan 40^\circ = (50 \text{ m}) \tan 40^\circ - x \tan 40^\circ \]

So \[ x = \frac{(50 \text{ m}) \tan 40^\circ}{\tan 30^\circ + \tan 40^\circ} = 29.6 \text{ m} \]

Therefore \[ d = (29.6 \text{ m}) \tan 30^\circ = 17 \text{ m} \]

88. (a) \[ 12.634 + 2.1 = 14.7 \]

(b) \[ 13.5 - 2.134 = 11.4 \]

(c) \[ \pi(0.25 \text{ m})^2 = 0.20 \text{ m}^2 \]

(d) \[ \sqrt{2.37/3.5} = 0.82 \]

89. These two are very close, so let's calculate to compare.

\[ 0.32/\text{L} = (0.32/\text{L}) \times \frac{3.785 \text{ L}}{1 \text{ gal}} = 1.21/\text{gal}. \text{ So } [0.32/\text{L} = 1.21/\text{gal}] > $1.20/\text{gal}. \]

Therefore $0.32/L is more.