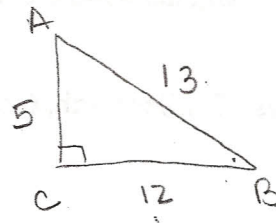


**CHAPTER 8 EXTRA PRACTICE**  
**PYTHAGOREAN THEOREM, SPECIAL RIGHT TRIANGLES, TRIG. RATIOS**

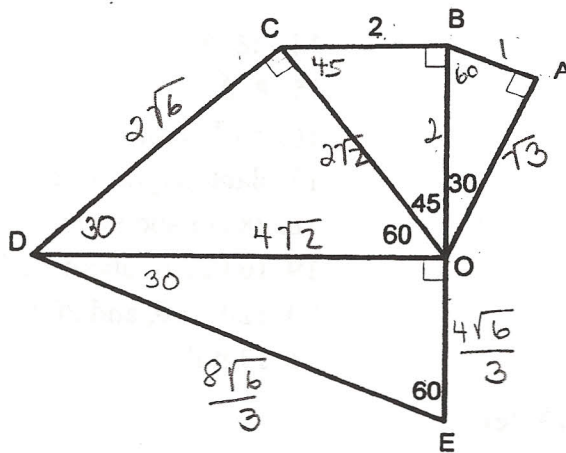
- At a point on the ground 100 ft. from the foot of a flagpole, the angle of elevation of the top of the pole contains a 31 degree angle. Find the height of the flagpole to the nearest foot.
- Find the length of the side of a square whose diagonal is 6.
- From the top of a lighthouse 190 ft. high, the angle of depression of a boat out at sea is 34 degrees. Find to the nearest foot, the distance from the boat to the foot of the lighthouse.
- The congruent sides of an isosceles triangle are each 15 in. and the base is 24 in. Find the length of the altitude drawn to the base.
- If  $\cos A = \sin 30^\circ$ , then angle A measures how many degrees?
- Find the length of the diagonal of a square whose side is 6 in. in length.
- Find to the nearest degree the measure of the angle of elevation of the sun if a post 5 ft. high casts a shadow 10 ft. long.
- The lengths of the bases of an isosceles trapezoid are 8 and 14 and each of the bases angles measures 45 degrees. Find the length of the altitude of the trapezoid and the length of the legs.

9. In triangle ABC, angle C is a right angle, AC = 5, BC = 12.

- Find AB. = 13
- Find the tan B.  $5/12$
- Find sin B.  $5/13$
- Find cos B.  $12/13$
- Find the measure of angle B to the nearest degree.  $23^\circ$



10.  $AO = \frac{\sqrt{3}}{2}$   
 $AB = 1$   
 $OB = 2$   
 $OC = 2\sqrt{2}$   
 $OD = 4\sqrt{2}$   
 $CD = \frac{2\sqrt{6}}{3}$   
 $DE = \frac{8\sqrt{6}}{3}$   
 $OE = \frac{4\sqrt{6}}{3}$



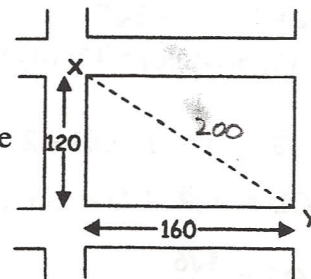
$$\frac{4\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{4\sqrt{6}}{3}$$

11. How many feet of walking would a person save by cutting across the vacant lot instead of taking the sidewalk around the outside edge?

$$120^2 + 160^2 = d^2$$

$$(120 + 160) - 200$$

$$= \boxed{80 \text{ ft}}$$



2. How many inches long must each side of a cubical box be if the distance from one corner is 12 in.? Answer with an expression in simplest form.

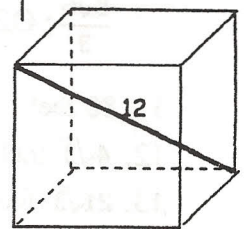
$$3x^2 = 12^2 = 144$$

$$x^2 = 48$$

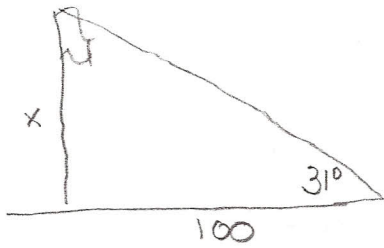
$$x = 4\sqrt{3} \text{ in}$$

$$l^2 + w^2 + h^2 = d^2$$

$$x^2 + x^2 + x^2 = d^2$$



①

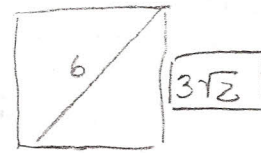


$$\tan 31 = \frac{x}{100}$$

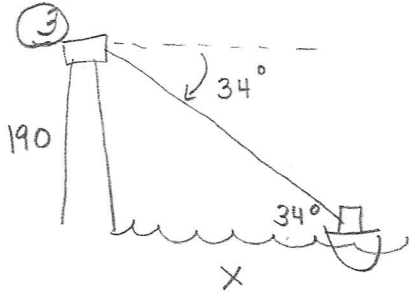
$$100 \tan 31 = x$$

$$\boxed{60 \text{ ft} = x}$$

②



③

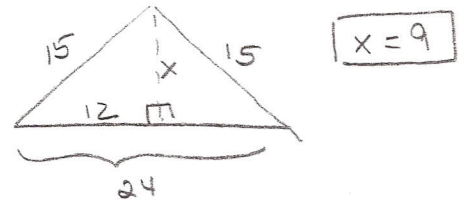


$$\tan 34 = \frac{190}{x}$$

$$x = \frac{190}{\tan 34}$$

$$x = 282 \text{ ft.}$$

④



$$\boxed{x = 9}$$

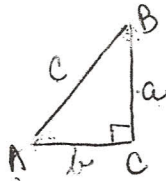
⑤

$$\cos A = \sin 30^\circ$$

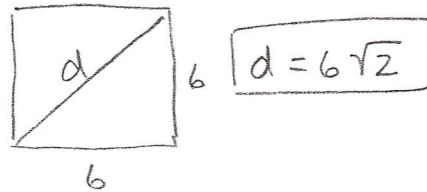
$$\cos A = .5$$

$$A = \cos^{-1}(.5)$$

$$\boxed{A = 60^\circ}$$

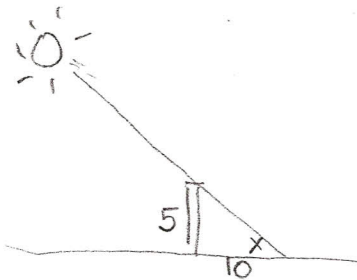


⑥



$$\boxed{d = 6\sqrt{2}}$$

⑦

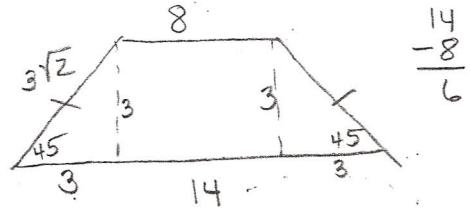


$$\tan x = \frac{5}{10}$$

$$x = \tan^{-1}\left(\frac{5}{10}\right)$$

$$x = 27^\circ$$

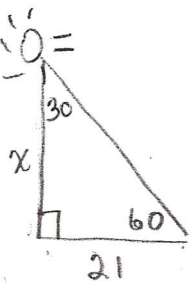
⑧



$$\frac{14}{6}$$

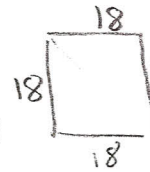
$$\boxed{\begin{array}{l} \text{alt} = 3 \\ \text{legs} = 3\sqrt{2} \end{array}}$$

⑬



$$\boxed{x = 21\sqrt{3}}$$

⑭

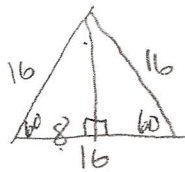


$$P = 72$$

$$A = 72/4 = 18$$

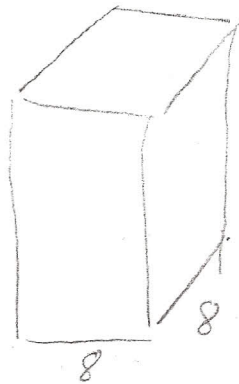
$$\boxed{d = 18\sqrt{2}}$$

15



$$\text{alt} = 8\sqrt{3}$$

16

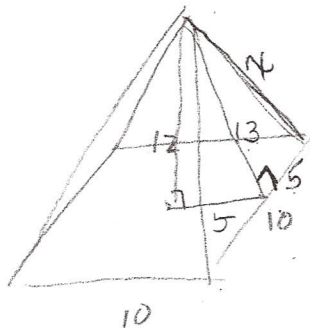


$$d^2 = l^2 + w^2 + h^2$$

$$d^2 = 8^2 + 8^2 + 12^2 = 64 + 64 + 144 = 272 = 16 \times 17$$

$$d = 4\sqrt{17}$$

17

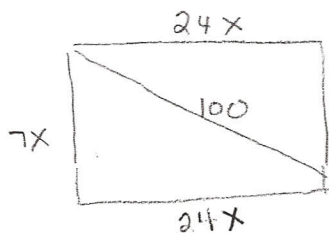


slant height = 13

what would the lateral edge be?

$$5^2 + 13^2 = x^2$$

18



$$(7x)^2 + (24x)^2 = 100^2$$

$$49x^2 + 576x^2 = 10000$$

$$625x^2 = 10000$$

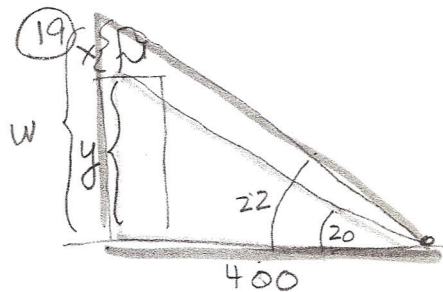
$$x^2 = \frac{10000}{625} = 16$$

$$x = 4$$

$$\text{length} = 96$$

$$\text{width} = 28$$

19



$$\tan 20 = \frac{y}{400}$$

$$400 \tan 20 = y = 145.588$$

$$\tan 22 = \frac{W}{400}$$

$$400 \tan 22 = W = 161.610$$

pole = 16 ft

$$(3x)^2 + (4x)^2 + (5x)^2 = (200\sqrt{2})^2$$

$$9x^2 + 16x^2 + 25x^2 = 80000$$

$$50x^2 = 80000$$

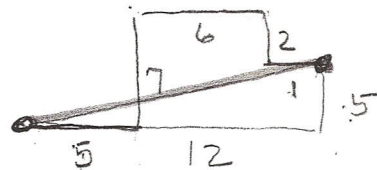
$$x^2 = 1600$$

$$x = 40$$

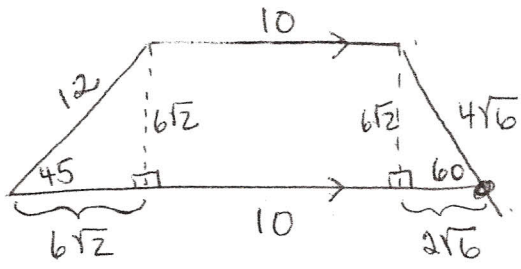
dimensions are  $120 \times 160 \times 200$

$$l^2 + w^2 + h^2 = d^2$$

21



$$d = 13$$



$$\frac{6\sqrt{2}}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{6\sqrt{6}}{3} = 2\sqrt{6}$$

$$\textcircled{12} + \textcircled{10} + \boxed{4\sqrt{6}} + \boxed{2\sqrt{6}} + \textcircled{10} + 6\sqrt{2}$$

$$32 + 6\sqrt{6} + 6\sqrt{2}$$