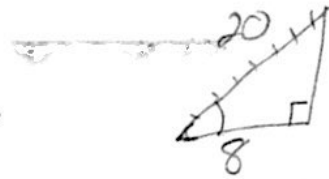


Geometry

1. A 20-foot ladder leans against a wall so that the base of the ladder is 8 feet from the base of the building. What angle does the ladder make with the ground?

$$\cos X = \frac{8}{20} \quad X = \cos^{-1}(8/20)$$

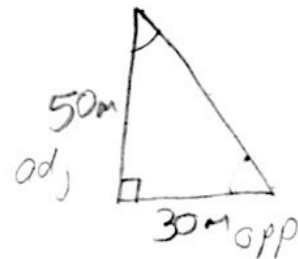
$$\boxed{X = 66.4^\circ}$$



2. A 50-meter vertical tower is braced with a cable secured at the top of the tower and tied 30 meters from the base. What angle does the cable form with the vertical tower?

$$\tan X = \frac{30}{50} \quad X = \tan^{-1}(30/50)$$

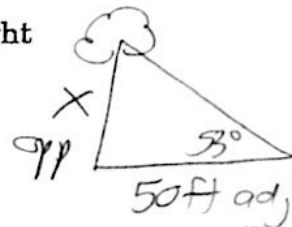
$$\boxed{X = 31^\circ}$$



3. At a point on the ground 50 feet from the foot of a tree, the angle of elevation to the top of the tree is 53°. Find the height of the tree.

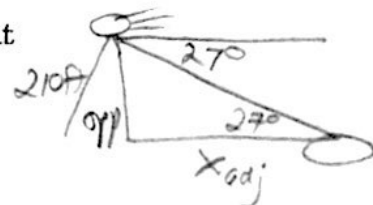
$$\tan 53 = \frac{x}{50} \quad 50 \tan 53 = x$$

$$\boxed{66. = x}$$



4. From the top of a lighthouse 210 feet high, the angle of depression of a boat is 27°. Find the distance from the boat to the foot of the lighthouse.

$$x = 412.1 \text{ ft} \quad \tan 27^\circ = \frac{210}{x} \quad \frac{x \tan 27^\circ = 210}{\tan 27^\circ \quad \tan 27^\circ}$$



1. Standardized Test Prep Which value is least?

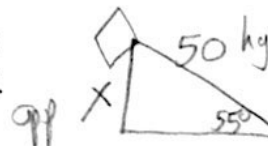
- A. $\cos 60^\circ$ B. $\sin 45^\circ$ C. $\tan 30^\circ$ D. $\sin 20^\circ$ E. $\cos 80^\circ$

0.50 0.71 0.577 0.34 0.17

2. Alison lets out 50 ft of twine on her kite. The angle of elevation is 55°. How high above Alison's hands is the kite?

$$\sin 55 = \frac{x}{50} \quad 50 \sin 55 = x$$

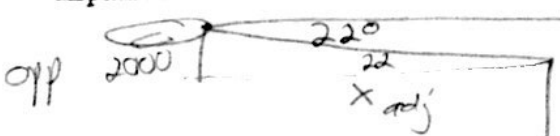
$$\boxed{41. = x}$$



3. An airplane pilot sights the top of a control tower at a 22° angle of depression. The airplane is 2000 ft above the tower. How far is the airplane from the tower?

$$\tan 22 = \frac{2000}{x} \quad x \tan 22 = 2000$$

$$\frac{x \tan 22 = 2000}{\tan 22 \quad \tan 22}$$



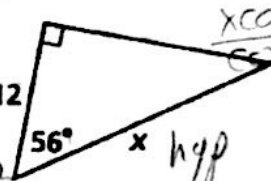
$$\boxed{X = 4950.1 \text{ ft}}$$

Find the value of x. Round lengths of segments to the nearest tenth and angle measures to the nearest degree.

4. $\cos 56 = \frac{12}{x} \quad x \cos 56 = 12$

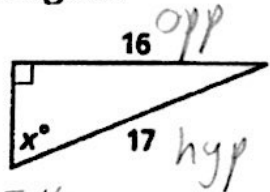
$$\frac{x \cos 56 = 12}{\cos 56 \quad \cos 56}$$

$$\boxed{X = 21.5}$$



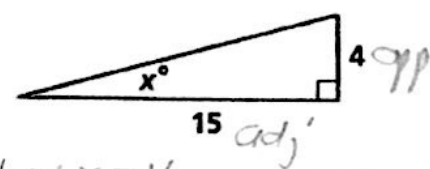
5. $\sin X = \frac{16}{17} \quad \sin^{-1}(16/17)$

$$\boxed{X = 70^\circ}$$



6. $\tan X = \frac{4}{15} \quad \tan^{-1}(4/15)$

$$\boxed{X = 15^\circ}$$



Describe each angle as it relates to the objects in the diagram.

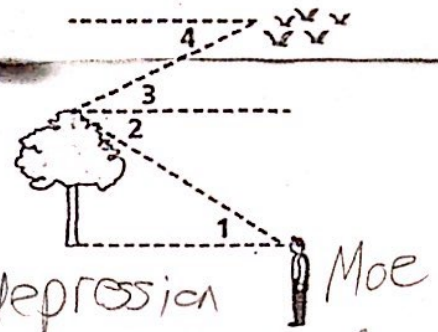
- a. $\angle 1$ b. $\angle 2$ c. $\angle 3$ d. $\angle 4$

(A) elevation
Moe to top
of tree

(B) depression
top of tree
to Moe

(C) elevation
top of tree
to birds

(D) depression
from birds to top of
tree



Find the area of each polygon. Round your answer to the nearest tenth.

23. a regular octagon with apothem 9 ft

24. a regular hexagon with radius 8 in.

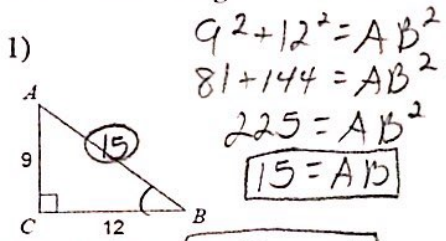
25. a regular pentagon with perimeter 50 cm

23. a regular hexagon with apothem 4 cm

24. a regular octagon with radius 5 ft

25. a regular pentagon with perimeter 100 m

Solve each triangle. Round answers to the nearest tenth.



$$9^2 + 12^2 = AB^2$$

$$81 + 144 = AB^2$$

$$225 = AB^2$$

$$15 = AB$$

$$\tan^{-1}(9/12) = 36.9 = \angle B$$

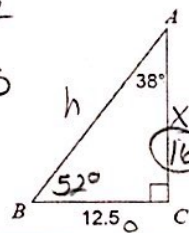
$$\tan^{-1}(12/9) = 53.1 = \angle A$$

2)

$$\frac{\sin 38^\circ}{1} = \frac{12.5}{h}$$

$$h \sin 38^\circ = 12.5$$

$$h = 20.3$$

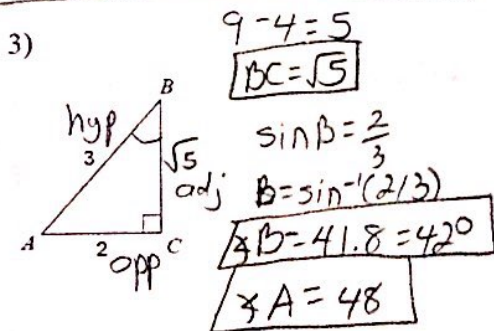


$$\frac{90}{-38} = \frac{52}{\angle B}$$

$$\tan 52^\circ = \frac{x}{12.5}$$

$$12.5 \tan 52^\circ = x$$

$$16 = x \quad AC$$



$$9 - 4 = 5$$

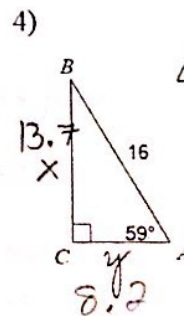
$$AB = \sqrt{5}$$

$$\sin B = \frac{2}{3}$$

$$B = \sin^{-1}(2/3)$$

$$\angle B = 41.8 = 42^\circ$$

$$\angle A = 48$$



$$\frac{\sin 59^\circ}{16} = \frac{x}{16}$$

$$x = 13.7$$

$$\cos 59^\circ = \frac{y}{16}$$

$$y = 8.2$$

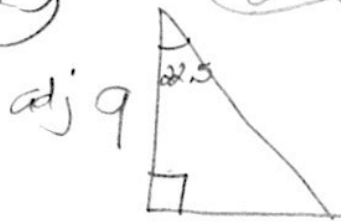
$$\frac{90}{-59} = \frac{59}{\angle B}$$

$$\angle B = 31$$

11 Review

Octagon

23



x opp
3.73

entire side = 2(3.73)
7.46

$$\frac{360}{8} = 45/2 = 22.5$$

$$\frac{\tan 22.5 = x}{1 \quad 9}$$

$$9 \tan 22.5 = x$$

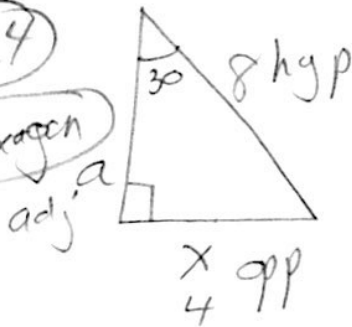
$$3.73 = x$$

$$\text{peri} = 7.46(8) = 59.68$$

$$A = \frac{1}{2}ap = \frac{1}{2}(9)(59.68) = \boxed{268.6 \text{ ft}^2}$$

24

Hexagon



x opp
4

entire side = 8

$$\frac{360}{6} = 60/2 = 30$$

$$\sin 30 = \frac{x}{8}$$

$$8 \sin 30 = x$$

$$4 = x$$

$$\text{perimeter} = 8(6) = 48$$

$$A = \frac{1}{2}ap$$

$$= \frac{1}{2}(6.9)(48)$$

$$= \boxed{165.6 \text{ in}^2}$$

$$\frac{\cos 30 = a}{1 \quad 8}$$

$$8 \cos 30 = a \quad a = 6.9$$

25 pentagon

peri = 50

$$\frac{50}{5} = 10$$

$$360/5 = 72/2 = 36$$

$$\tan 36 = \frac{5}{a}$$

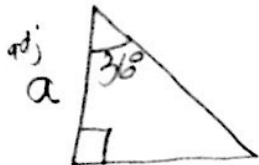
$$a \tan 36 = 5$$

$$\frac{5}{\tan 36} = a = 6.88$$

$$A = \frac{1}{2}ap$$

$$= \frac{1}{2}(6.88)(50)$$

$$= \boxed{172 \text{ cm}^2}$$

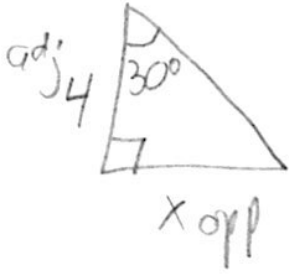


5 opp

entire side = 10

②③ hexagon $\frac{360}{6} = 60/2 = 30$

$$A = \frac{1}{2}ap$$



$$\tan 30 = \frac{x}{4}$$

$$4 \tan 30 = x$$
$$2 \cdot 30 = x$$

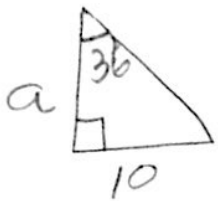
$$= \frac{1}{2}(4)(27.6)$$
$$= \boxed{55.2 \text{ cm}^2}$$

entire side $2.3(2) = 4.6$ peri = $4.6(6) = 27.6$

②⑤ ~~cos 36~~ pentagon

$$\text{peri} = 100$$

$$\frac{360}{5} = 72/2 = 36$$



$$\frac{100}{5} = 20/2 = 10$$

$$\tan 36 = \frac{10}{a}$$

$$\frac{a \tan 36 = 10}{\tan 36 \quad \tan 36}$$
$$a = 13.76$$

$$A = \frac{1}{2}ap$$

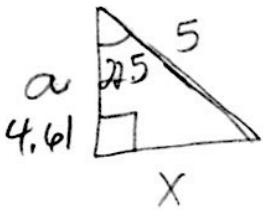
$$= \frac{1}{2}(13.76)(100)$$
$$= \boxed{688 \text{ m}^2}$$

②④ octagon

$$\text{radius} = 5 \text{ ft}$$

$$\frac{360}{8} = 45/2 = 22.5$$

$$A = \frac{1}{2}(4.61)(30.56)$$
$$= \boxed{70.4 \text{ ft}^2}$$



$$\frac{\cos 22.5 = a}{1 \quad 5}$$

$$5 \cos 22.5 = a$$
$$4.61 = a$$

$$\frac{\sin 22.5 = x}{1 \quad 5}$$

$$5 \sin 22.5 = x$$
$$1.91 = x$$

$$\text{entire side}$$
$$1.91(2) = 3.82$$

$$3.82(8) = 30.56 \text{ peri}$$