G4: B Level Test Review
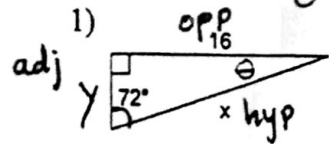
Date_____ Period____

Find ALL the missing SIDES and ANGLES of the triangle. Solve for X, Y, and theta. Round to the nearest hundredth.
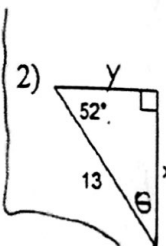
$\theta = 18°$ (Triangle Sum theorem)

1)

opp 16
adj
y 72°
x hyp
θ

$\tan(72°) = \dfrac{16}{y}$

$\dfrac{16}{\tan(72°)} = \boxed{y = 5.19}$

$\sin(\theta) = \dfrac{16}{x}$

$\dfrac{16}{\sin(72°)} = \boxed{16.82 = X}$

2)
$\theta = 38°$

y
52°
13 x
θ

$\sin(52°) = \dfrac{x}{13}$

$\boxed{X = 10.24}$

$\cos(52°) = \dfrac{y}{13}$

$\boxed{y = 8}$

3)

x
51°
.17 39° y
θ

$\sin(51°) = \dfrac{17}{y}$
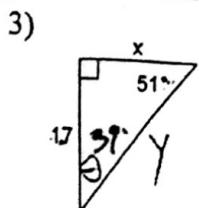
$\boxed{y = 21.87}$

$\tan(51°) = \dfrac{17}{x}$

$\boxed{X = 13.77}$

$\boxed{\theta = 39°}$

4)

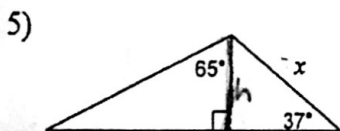$\sin(25°) = \dfrac{20}{y}$ $\boxed{y = 47.32}$

25°
x y
θ
20
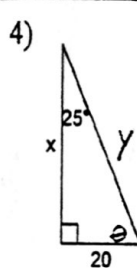
$\cos(25°) = \dfrac{x}{47.23}$

$\boxed{X = 42.89}$

$\boxed{\theta = 65°}$

Find the length of the side labeled x. Round your answer to the nearest hundredth.
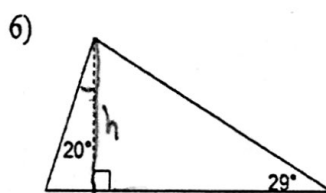
5)

65° h x
37°

$\tan(65°) = \dfrac{11}{h}$

$\boxed{h = 5.12}$

then: $\sin(37°) = \dfrac{5.12}{x}$
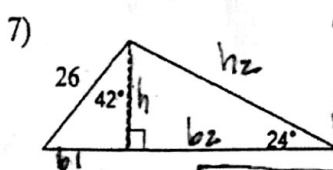
$\boxed{X = 8.51}$

6)
$h = 101.66$

20° h
37 x 29°

$\tan(20°) = \dfrac{37}{h}$

Then:
$\tan(29°) = \dfrac{101.67}{x}$

$\boxed{X = 183.40}$

Find the area and perimeter of the triangle. Round your answers to the nearest hundredth.

$A = \dfrac{1}{2}bh$

7)

26 h₂
42° h
b₁ b₂ 24°

$A = \dfrac{1}{2}(17.39 + 43.40)(19.32)$

$\boxed{A = 587.23 \ un^2}$

$\cos(42°) = \dfrac{h}{26}$ $\boxed{h = 19.32}$

$P = 26 + 47.50 + 43.40 + 17.39$

$\boxed{P = 134.29}$ un

because $\sin(42°) = \dfrac{b_1}{26}$ $\boxed{b_1 = 17.39}$

$\tan(24) = \dfrac{19.32}{b_2}$ $\boxed{b_2 = 43.40}$

$\sin(24°) = 19.32/h_2$ $\boxed{h_2 = 47.50}$

8)

$\sin(50°) = \dfrac{h}{42}$ $\boxed{h = 32.17}$

h₂
h
50° b₁ b₂ 30°
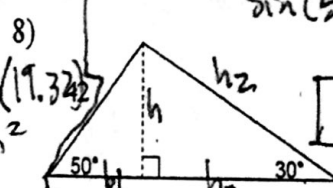
$\boxed{b_1 = 26.99}$

$\sin(30°) = \dfrac{32.17}{h_2}$ $\boxed{h_2 = 64.3}$

$\boxed{b_2 = 55.72}$

$\boxed{P = 189.05}$ $\boxed{A = 1330.39 \ un^2}$

-1-

Draw a diagram and then solve the problem.

9) A ship travels east from Port Lincoln 24 miles before turning north. When the ship becomes disabled and radios for help, the rescue boat needs to know the fastest route to the ship. The rescue boat navigator finds that the shortest route from Port Lincoln is 48 miles long. At what angle off of due east should the rescue boat travel to take the shortest route to the ship?

$$\theta = \cos^{-1}\left(\frac{24}{48}\right)$$

$$\theta = 60°$$

48mi, 24mi, P.L., θ
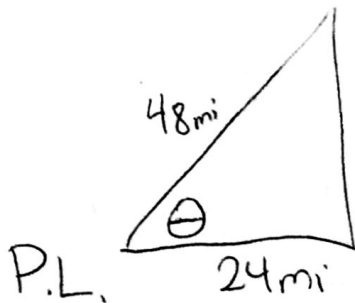
10) A surveyor is standing 100 meters from a bridge. She determines that the angle of elevation to the top of the bridge is 35°. The surveyor's eye level is 1.45 meters above the ground. Find the height of the bridge..
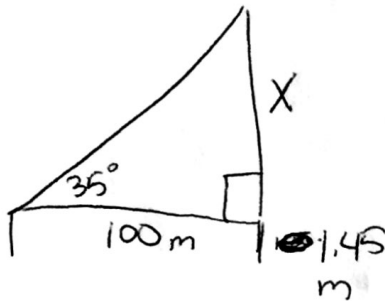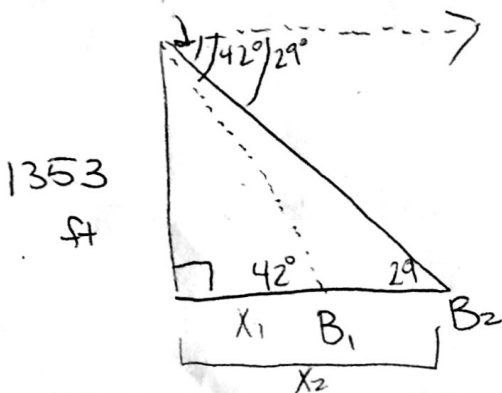
$$\tan 35 = \frac{x}{100}$$

$$x = 100 \cdot \tan 35$$

$$x = 70.02 \ m$$

$$Height = 70.02 \ m + 1.45 \ m$$

$$\boxed{= 71.47m}$$

35°, 100m, 1.45 m, X

11) Danica is in the observation area of the Sears Tower in Chicago overlooking Lake Michigan. She sights two sailboats going due east from the tower. The angles of depression to the two boats are 42 degrees and 29 degrees. If the observation deck is 1,353 feet high, how far apart are the boats?

$$\tan 29° = \frac{1353}{x_2}$$

$$x_2 = \frac{1353}{\tan 29}$$

$$\boxed{x_2 = 2440.88}$$
ft

$$\tan 42° = \frac{1353}{x_2}$$
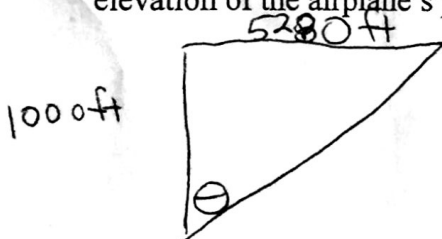
$$x_2 = \frac{1353}{\tan 42}$$

$$= \boxed{1502.66 \ ft}$$

distance between boat = 2440.88 - 1502.66 ft

$$= \boxed{938.12}$$

1353 ft, 42°, 29°, X₁ B₁ B₂, X₂

12) An airplane rises vertically 1000 feet over a horizontal distance of 1 mile. What is the angle of elevation of the airplane's path? (hint: there are 5,280 feet in a mile)

5280 ft, 1000 ft

$$\theta = \tan^{-1}\left(\frac{5280}{1000}\right)$$

$$\boxed{\theta = 79.28°}$$