Math 2

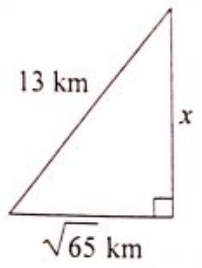
Name Key

Trigonometry Test Review

Date _____ Period ____

Find the missing side of each triangle. Leave your answers in simplest radical form.

1)



$\sqrt{65}^2 + x^2 = 13^2$

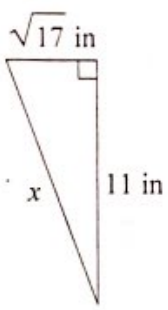
$x^2 = 13^2 - 65$

$x = \sqrt{104}$

104
$4 \cdot 26$
$2 \cdot 2 \cdot 13$

$x = 2\sqrt{26}$

2)



$\sqrt{17}^2 + 11^2 = x^2$

$17 + 121 = x^2$

$\sqrt{138} = x$

State if the three sides lengths form a right triangle.

3) 9 yd, $5\sqrt{7}$ yd, 16 yd

$9^2 + (5\sqrt{7})^2 = 16^2$ yes!

$81 + 175 = 256$

$256 = 256$ ✓

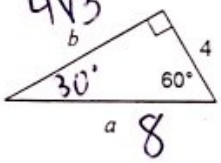
4) $\sqrt{74}$ cm, $\sqrt{122}$ cm, 19 cm

$\sqrt{74}^2 + \sqrt{122}^2 = 19^2$ No!

$196 \neq 361$

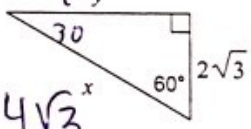
Find the missing side lengths. Leave your answers as radicals in simplest form.

5) $4\sqrt{3}$



8

6) 6 $2\sqrt{3}$

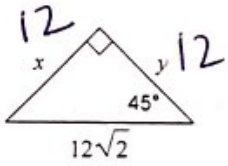


$4\sqrt{3}$

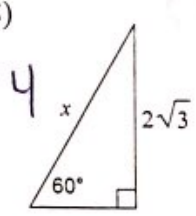
$2\sqrt{3} \cdot \sqrt{3} = 2\sqrt{9}$

$= 2 \cdot 3$

7) 12

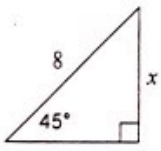


8)



2

9)

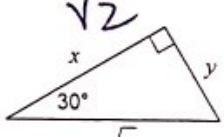


$4\sqrt{2}$

$4\sqrt{2}$

$8 \cdot \frac{\sqrt{2}}{2} = 4\sqrt{2}$

10) $\sqrt{2}$



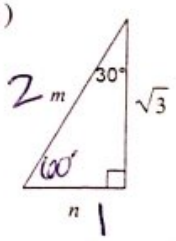
$\frac{\sqrt{6}}{3}$

$\frac{\sqrt{6}}{3} \cdot \sqrt{3} = \frac{\sqrt{18}}{3}$

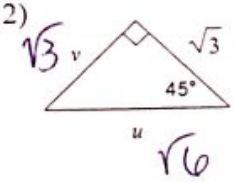
18
$9 \cdot 2$
$3 \cdot 3$

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

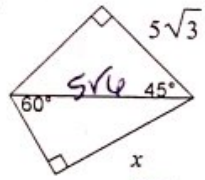
11)



12)



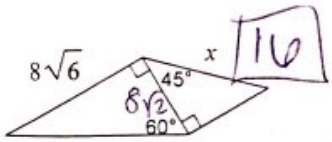
13)



$\frac{5\sqrt{6}}{2}$

$\frac{5\sqrt{6}}{2} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{5\sqrt{18}}{2} = \frac{15\sqrt{2}}{2}$

14)

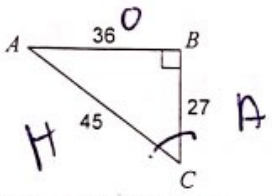


$16\sqrt{2}$

$8\sqrt{2} \cdot \sqrt{2} = 8\sqrt{4}$

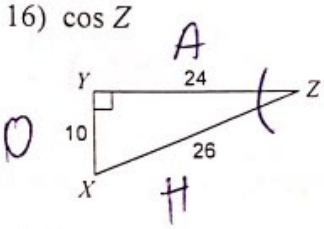
Find the value of each trigonometric ratio.

15) sin *C*



$\frac{36}{45} = \frac{4}{5}$

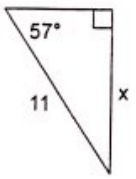
16) cos *Z*



$\frac{24}{26} = \frac{12}{13}$

Find the missing side or angle. Round to two decimal places.

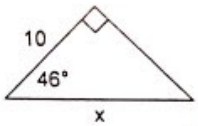
17)



$\sin 57 = \frac{x}{11}$

$x = 9.23$

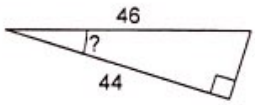
18)



$\cos 46 = \frac{10}{x}$

$x = 14.40$

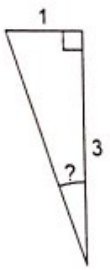
19)



$\cos x = \frac{44}{46}$

$x = 16.96°$

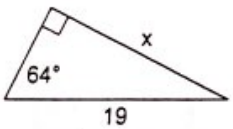
20)



$\tan x = 1/3$

$x = 18.43$

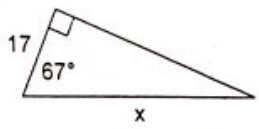
21)



$\sin 64 = \frac{x}{19}$

$x = 17.08$

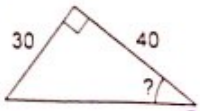
22)



$\cos 67 = \frac{17}{x}$

$x = 43.51$

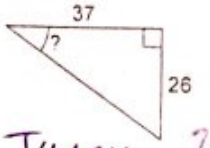
23)



$\tan x = \frac{30}{40}$

$x = 36.87°$

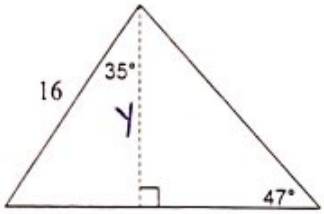
24)



$\tan x = \frac{26}{37}$ $x = 35.1°$

Find the length of the side labeled x. Round final answer to two decimal places.

25)



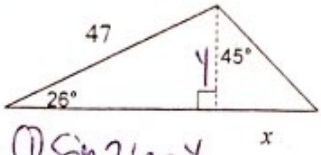
① $\cos 35 = \frac{y}{16}$

$y = 13.11$

② $\tan 47 = \frac{y}{x}$

$x = 12.22$

26)



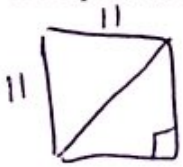
① $\sin 26 = \frac{y}{47}$

$y = 20.60$

② $\tan 45 = \frac{x}{y}$

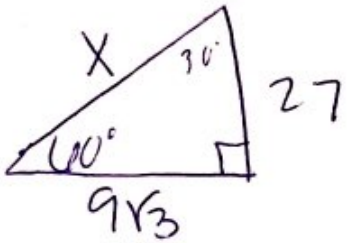
$x = 20.60$

27) The area of a square is 121 m^2. How long is the diagonal? Exact answers only.



$11\sqrt{2}\ m$

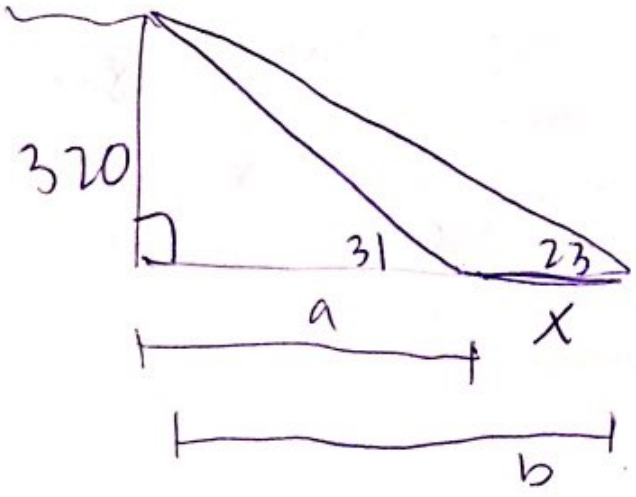
28) A conveyor belt carries supplies from the first floor to the second floor, which is 27 feet higher. The belt makes a 60° angle with the ground. How far do the supplies travel from one end of the conveyor belt to the other? Exact answers only.



$x = 18\sqrt{3}$

$\frac{27\sqrt{3}}{3} = 9\sqrt{3}$

29) Two people are looking up at a cliff that is 320 feet high. The person closer to the cliff looks up at an angle of elevation of 31° and the second person looks up at an angle of elevation of 23°. How far apart are the two people? Round to two decimal places.



① $\tan 31 = \frac{320}{a}$

$a = 532.57$

② $\tan 23 = \frac{320}{b}$

$b = 753.87$

③ $x = b - a$

$x = 221.30 ft$

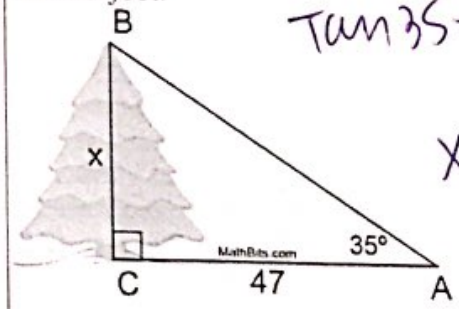
MathBitsNotebook
Geometry

Trigonometry – Word Problems

Name _____

Directions: Be sure to show your work.

1. From a point on the ground 47 feet from the foot of a tree, the angle of elevation of the top of the tree is 35°. Find the height of the tree to the *nearest foot*.



$\tan 35 = \frac{x}{47}$

$x = 32.91$

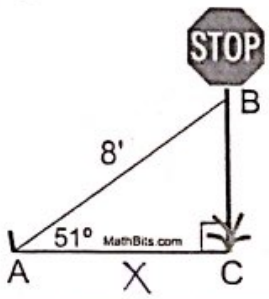
so 33ft

2. An 8 foot metal guy wire is attached to a broken stop sign to secure its position until repairs can be made. Attached to a stake in the ground, the guy wire makes an angle of 51° with the ground. How far from the foot of the stop sign is the stake, to the *nearest tenth of a foot*?

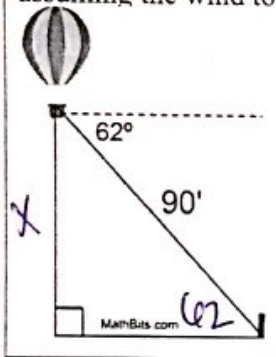
$\cos 51 = \frac{x}{8}$

$x = 5.03$

so 5.0



3. On a windy day, a 90 foot rope tightly secures a hot air balloon to a stake in the ground. From the balloon, the angle of depression of the stake is 62°. Find, to the *nearest foot*, the height of the balloon, assuming the wind to be constant.

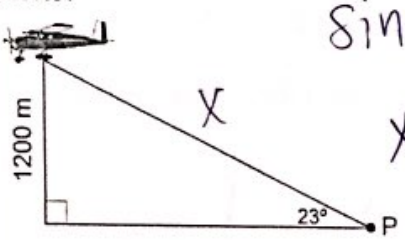


$\sin 62 = \frac{x}{90}$

$x = 79.47$

so 79ft

4. From point *P* on the ground, the angle of elevation of an airplane is 23°. The altitude of the plane is 1200 meters. What is the distance from point *P* to the airplane, to the *nearest tenth* of a meter?

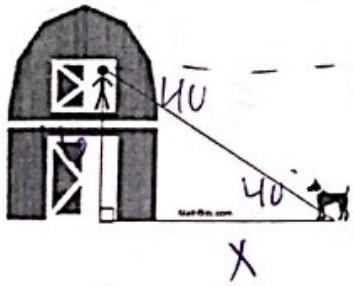


$\sin 23 = \frac{1200}{x}$

$x = 3071.10$

so 3071.2 m

5. From the hay loft door, Ted sees his dog on the ground. The angle of depression of the dog is 40°. Ted's eye level is 16 feet above the ground. How many feet must the dog walk to reach the open barn door directly below Ted (to the *nearest foot*)?



$\tan 40 = \frac{16}{x}$

$x = 19.07$

so 19ft

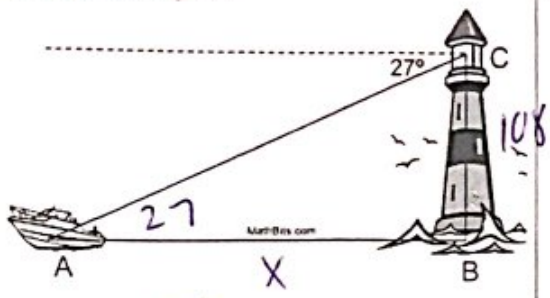
6. A shopper is standing on level ground 800 feet from the base of a 250 foot tall department store. The shopper looks up and sees a flag on the store's roof. To the *nearest degree* what is the angle of elevation to the top of the building from the point on the ground where the shopper is standing?

$\tan x = \frac{250}{800}$

$x = 17.35$

so 17°

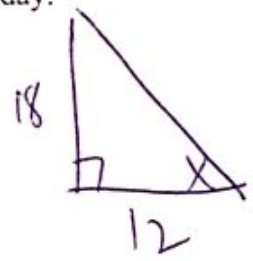
7. From the top of a 108 foot lighthouse, the angle of depression of a boat at sea is 27°. Find the horizontal distance from the boat to the base of the lighthouse, to the *nearest foot.*



$\tan 27 = \frac{108}{x}$

$x = 211.96$ so 212ft

8. A flag pole 18 feet tall casts a shadow 12 feet long at a specific time of day. Find, to the *nearest degree*, the angle of elevation of the sun at this time of day.



$\tan x = \frac{18}{12}$

$x = 56.31$

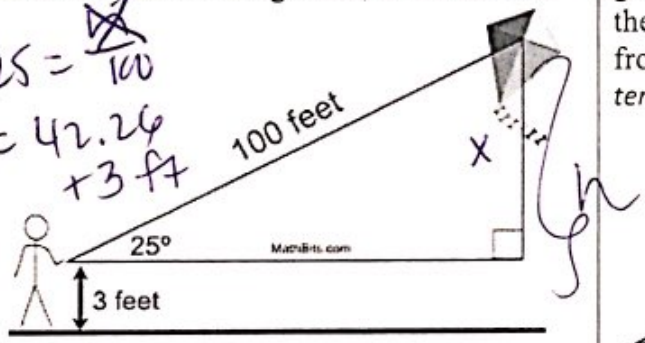
so 56°

9. A student lets out 100 feet of string on a kite from a hand height of 3 feet. The angle between horizontal hand height and the kite is 25°. Find the height of the kite above the ground, to the *nearest foot.*

$\sin 25 = \frac{x}{100}$

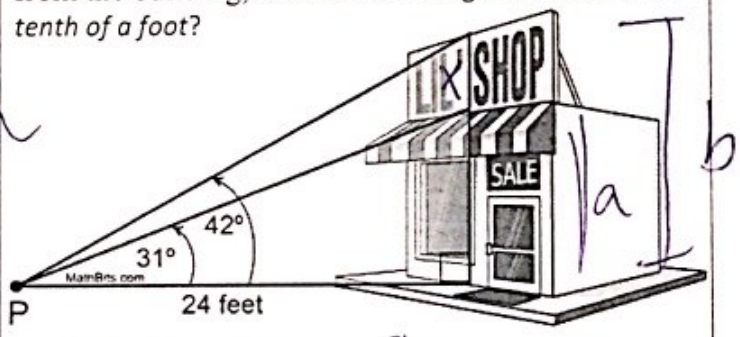
$x = 42.26$

$+3$ ft



$h = 45.26$ so 45ft

10. Simon bought a new shop and wants to order a new sign for the roof of the building. From point *P*, he finds the angle of elevation of the roof, from ground level, to be 31° and the angle of elevation of the top of the sign to be 42°. If point *P* is 24 feet from the building, how tall is the sign to the *nearest tenth of a foot*?



① $\tan 31 = \frac{a}{24}$

$a = 14.42$

② $\tan 42 = \frac{b}{24}$

$b = 21.61$

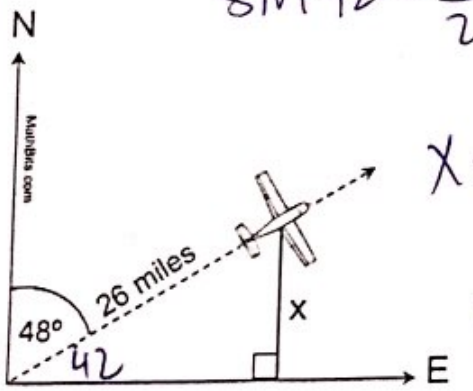
③ $x = b - a$

$x = 7.189$

so 7.2 ft

11. A plane has traveled 26 miles on a course heading 48° east of north. How far north (x) has the plane traveled at this point, to the *nearest tenth of a mile*?

$\sin 42 = \frac{x}{26}$



$x = 17.397$

so 17.4ft