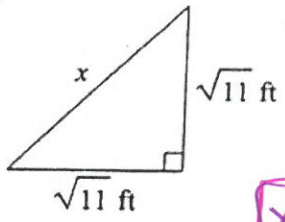
Key Spr '17

Right Triangles Test Review

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

1)



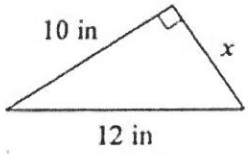
$(\sqrt{11})^2+(\sqrt{11})^2=x^2$

OR

45-45-90 △

$x=\sqrt{22}$ ft

2)



$10^2+x^2=12^2$

$x^2=44$

$x=2\sqrt{11}$ in

Determine if the 3 sides form a right, acute, or obtuse triangle.

* Remember c = biggest side + should go on a side of equation by itself!

$c^2 ? a^2+b^2$

> obtuse △

< acute △

= right △

3) 10 km, 6 km, $2\sqrt{34}$ km

$(2\sqrt{34})^2 ? 10^2+6^2$

$136 = 136$

Right △

4) $\sqrt{127}$ yd, $\sqrt{17}$ yd, 12 yd

$12^2 ? (\sqrt{17})^2+(\sqrt{127})^2$

$144 = 17+127$

Right △

5) 9, $2\sqrt{22}$, 13

$13^2 ? 9^2+(2\sqrt{22})^2$

$169 = 81+88$

Right △

6) $\sqrt{7}$, $\sqrt{11}$, 4

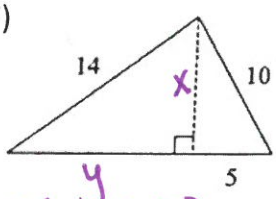
$4^2 ? \sqrt{7}^2+\sqrt{11}^2$

$16 < 7+11$

acute △

Find the area of each triangle. Round your answer to the tenths place.

7)



$x^2+5^2=10^2$

$x=5\sqrt{3}$

$(5\sqrt{3})^2+y^2=14^2$

$75+y^2=196$

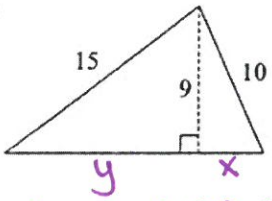
$y=\sqrt{121}$

$y=11$

Area $=\frac{1}{2}(16)(5\sqrt{3})$

$40\sqrt{3}$ units^2

8)



$x^2+9^2=10^2$

$x=\sqrt{19}$

$y^2+9^2=15^2$

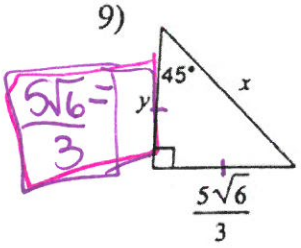
$y=12$

Area $=\frac{1}{2}(9)(12+\sqrt{19})$

Area = 73.6 units^2

Find the value of the variables. Express your answers in simplest radical form.

9)



$\frac{5\sqrt{6}}{3}=y$

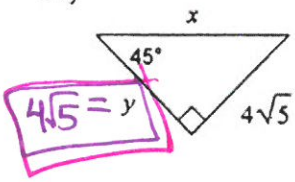
$h=l\cdot\sqrt{2}$

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

$x=\frac{5\sqrt{12}}{3}=\frac{5\cdot 2\sqrt{3}}{3}$

$x=\frac{10\sqrt{3}}{3}$

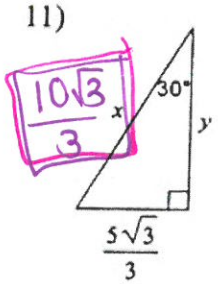
10)



$x=4\sqrt{5}\cdot\sqrt{2}$

$x=4\sqrt{10}$

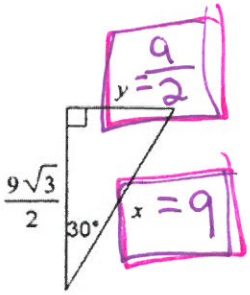
11)

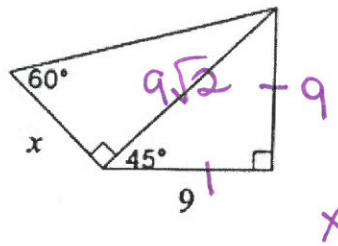


$y=\frac{5\sqrt{3}}{3}\cdot\sqrt{3}$

$y=5$

12)



13) 

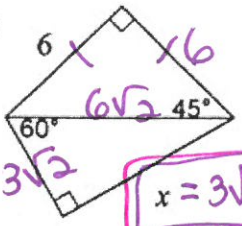
$9 = 9\sqrt{3}$

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

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

$x = \frac{9\sqrt{6}}{3}$

$3\sqrt{6} = x$

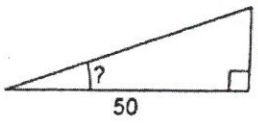
14) 

$x = 3\sqrt{6}$

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

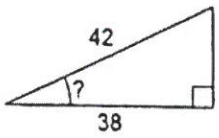
$x = 3\sqrt{2} \cdot \sqrt{3}$

Find the value of the variable. For your final answers, round angles to the nearest degree and sides to the tenths place.

15) 

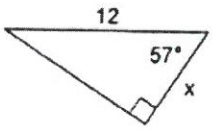
$x = \tan^{-1}\left(\frac{17}{50}\right)$

$x = 19°$

16) 

$\cos^{-1}\left(\frac{38}{42}\right)$

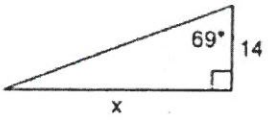
$25°$

17) 

$\cos(57) = \frac{x}{12}$

$x = 12\cos(57)$

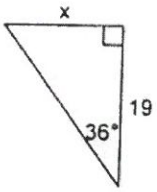
$x = 6.5$

18) 

$\tan(69) = \frac{x}{14}$

$x = 14\tan(69)$

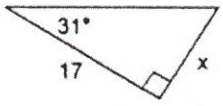
36.5

19) 

$\tan(36) = \frac{x}{19}$

$x = 19\tan(36)$

$x = 13.8$

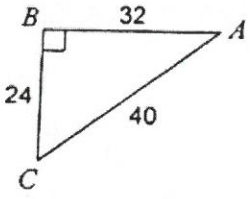
20) 

$\tan(31) = \frac{x}{17}$

$x = 17\tan(31)$

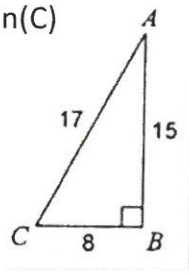
$x = 10.2$

Find the value of each trigonometric ratio.

21) tanC 

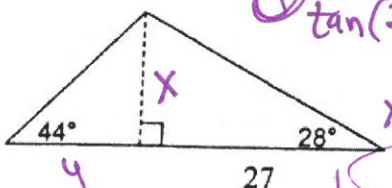
$\tan C = \frac{32}{24}$

$\frac{4}{3}$

22) sin(C) 

$\frac{15}{17}$

Find the area of each triangle. Round your final answer to the hundredths place.

23) 

① $\tan(28) = \frac{x}{27}$

$x = 27\tan(28)$

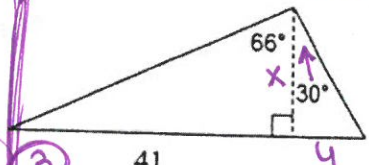
$x = 14.3562$

② $\tan(44) = \frac{14.3562}{y}$

$14.8662 \approx y = \frac{14.3562}{\tan(44)}$

③ $\text{Area} = \frac{1}{2}(14.3562)(27 + 14.8662)$

300.52 units^2

24) 

① $\tan(66) = \frac{41}{x}$

$x = \frac{41}{\tan(66)}$

$x = 18.2544$

② $\tan(30) = \frac{y}{18.2544}$

$y = 31.6175$

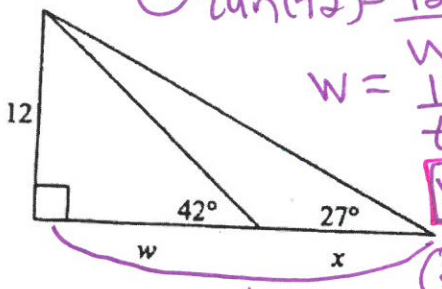
$y = \frac{18.2544}{\tan(30)}$

③ $\text{Area} = \frac{1}{2}(18.2544)(72.6175)$

662.79 units^2

Find the values of w and x. Round angles to the nearest degree and sides to the nearest tenth.

25)



① $\tan(42) = \frac{12}{w}$

$w = \frac{12}{\tan(42)} \approx 13.327$

$w \approx 13.3$

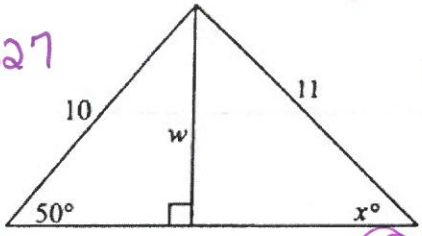
② $\tan(27) = \frac{12}{y}$

$y = \frac{12}{\tan(27)} \approx 23.551$

③ $x = y - w$

$x \approx 10.2$

26)



① $\sin(50) = \frac{w}{10}$

$w = 10\sin(50)$

$w \approx 7.660$

$w \approx 7.7$

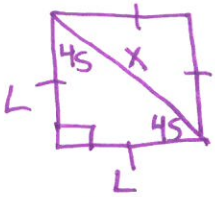
② $\sin(x) = \frac{7.660}{11}$

$x = \sin^{-1}\left(\frac{7.660}{11}\right)$

$x \approx 44°$

Application Problems

27) The area of a square garden is 128 m^2. How long is the diagonal across the garden?



$A = L\sqrt{2}$

$x = L\sqrt{2}$

$L = \frac{x}{\sqrt{2}}$ $L = \frac{x\sqrt{2}}{2}$

$128 = \frac{2x^2}{4}$ ← $128 = \left(\frac{x\sqrt{2}}{2}\right)^2$

$128 = \frac{1}{2}x^2 \rightarrow 256 = x^2$

$x = 16m$

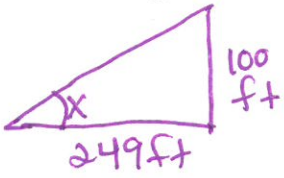
28) A conveyor belt carries supplies from the 1st floor to the 2nd floor, which is 26 feet higher. The belt makes a 60° angle with the ground. To the nearest foot, how far do the supplies travel from one end of the conveyor belt to the other?

$\sin(60) = \frac{26}{x}$ OR $\frac{26}{\sqrt{3}} \times 2$

$x = \frac{26}{\sin(60)}$

30ft

29) A large totem pole in the state of Washington is 100 feet tall. At a particular time of day, the totem pole casts a 249 foot long shadow. Find the measure of the angle of elevation from the end of the shadow to the nearest degree?

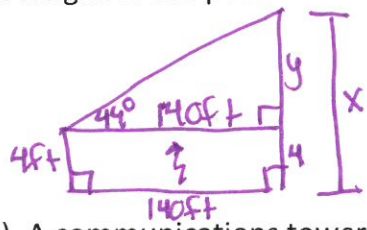


$x = \tan^{-1}\left(\frac{100}{249}\right)$

$x \approx 21.88$

22°

30) To find the height of a pole, a surveyor moves 140 feet away from the base of the pole and then, with a transit 4 feet tall, measures the angle of elevation to the top of the pole to be 44°. To the nearest tenth of a foot, what is the height of the pole?



$\tan(44) = \frac{y}{140}$

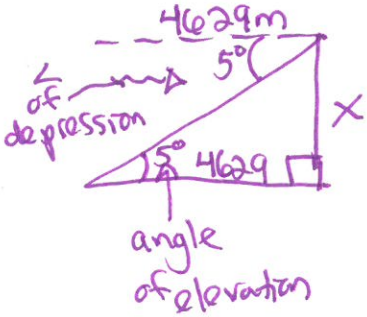
$y = 140\tan(44)$

$y = 135.196$

$x = 135.196 + 4$

$x = 139.2ft$

31) An airplane pilot over the Pacific sights an atoll at an angle of depression of 5 degrees. At this time, the horizontal distance from the airplane to the atoll is 4629 meters. To the nearest meter, what is the height of the plane?



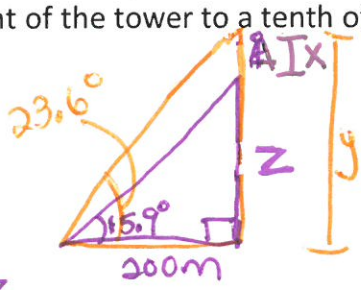
$\tan(5) = \frac{x}{4629m}$

$x = 4629\tan(5)$

≈ 404.985

405 m

32) A communications tower is built on the top of a building with the following specifications: from a point 200 meters away from the base of the building, the angle of elevation to the top of the building is ~~23.6°~~ 15.9°, and the angle of elevation to the top of the tower is ~~15.9°~~ 23.6°. Find the height of the tower to a tenth of a meter.



$\tan(15.9) = \frac{z}{200}$

$z = 200\tan(15.9)$

≈ 56.971

$\tan(23.6) = \frac{y}{200}$

$87.379 \approx y = 200\tan(23.6)$

$x = y - z$

$x \approx 30.4\ m$