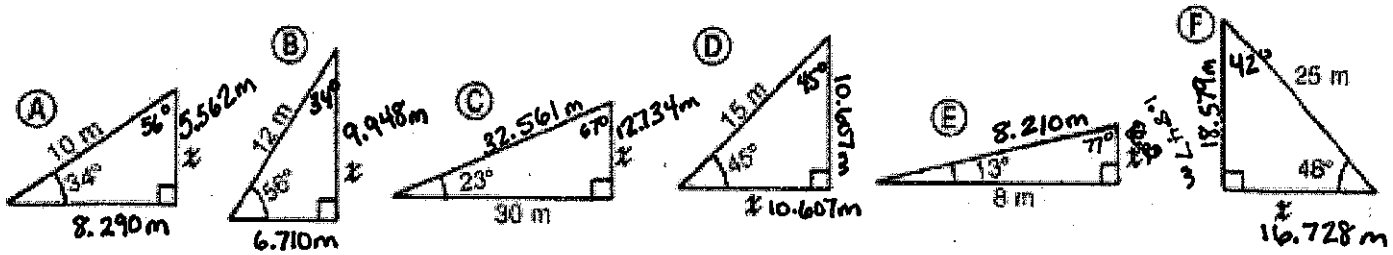
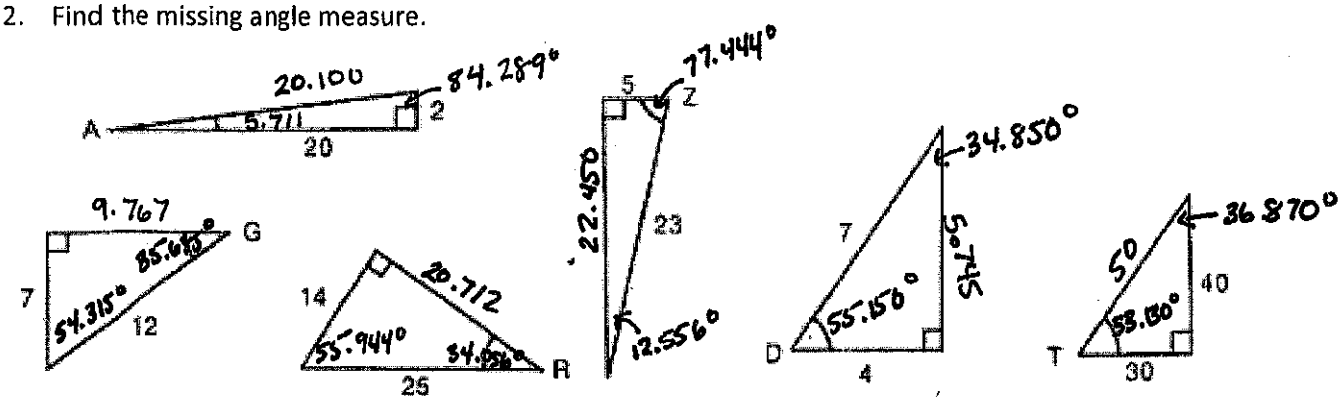
Unit 7 Right Triangle Test Review **CMIC 2** **Name:** Key

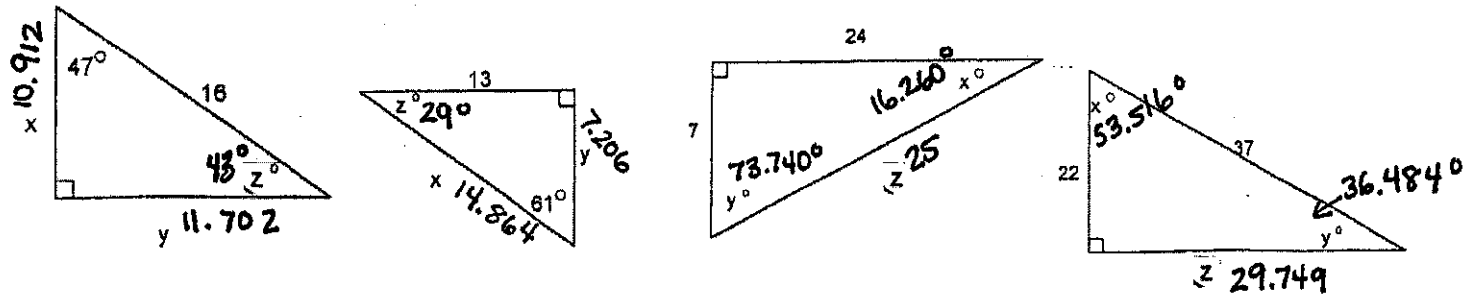
1. Find the missing side length.



2. Find the missing angle measure.

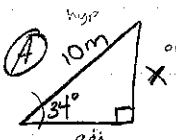


3. Find all missing lengths and angle measures.

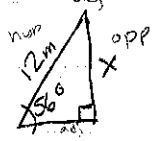


4. Draw a picture for each situation then use trig ratios to solve.
   a. Suppose the angle of elevation from a ship to the top of a lighthouse on top of cliff is 6°. The lighthouse is 60 feet tall and the cliff is 250 feet high. Find the distance from the ship to the top of the lighthouse. 178.979 ft
   b. A car is driven up a slop of 6° for 150 meters then driven another 100 meters at a slope of 9°. How far has the car climbed vertically? 31.322 m
   c. The angle of depression from a hot air balloon to its landing target is 12°. If the balloon is 175 feet high, find its distance measured along the ground from the target. 823.310 ft
   d. A surveyor measures the top of a building 100 feet away from him. His theodolite (angle-measure device) is 5 feet above ground. The angle of elevation to the top of the building is 45°. How tall is the building? 105 ft
   e. A forest ranger looking out from a ranger's station can see a forest fire at 30° angle of depression. The ranger's position is 125 feet above ground. How far is it from the ranger's station to the fire? 216.506 ft
   f. A ladder on a fire truck has its base 8 feet above the ground. The maximum length of the ladder is 100 feet. If the greatest angle the ladder can make with the ground is 70°, what is the highest it can reach? 101.969 ft

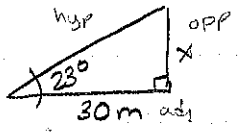
(1)

A. 

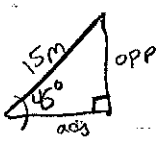
$\sin(34) = \frac{x}{10}$ $\quad x = 5.592$ $\quad \cos(34) = \frac{x}{10}$ $\quad x = 8.290$ $\quad 90 - 34 = 56°$

B. 

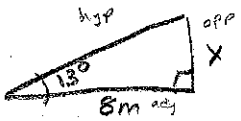
$\sin(56) = \frac{x}{12}$ $\quad x = 9.948$ $\quad \cos(56) = \frac{x}{12}$ $\quad x = 6.710$ $\quad 90 - 56 = 34°$

C. 

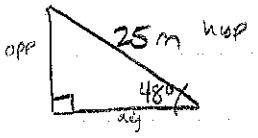
$\tan(23) = \frac{x}{30}$ $\quad x = 12.734$ $\quad \cos(23) = \frac{30}{x}$ $\quad x = 32.561$ $\quad 90 - 23 = 67°$

D. 

$\sin(45) = \frac{x}{15}$ $\quad x = 10.607$ $\quad \cos(45) = \frac{x}{15}$ $\quad x = 10.607$ $\quad 90 - 45 = 45°$

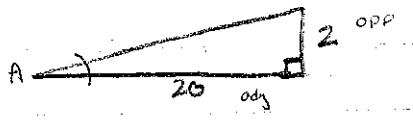
E. 

$\cos(13) = \frac{8}{x}$ $\quad x = 8.210$ $\quad \tan(13) = \frac{x}{8}$ $\quad x = 1.847$ $\quad 90 - 13 = 77°$

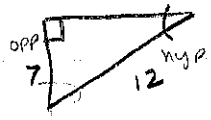
F. 

$\sin(48) = \frac{x}{25}$ $\quad x = 18.579$ $\quad \cos(48) = \frac{x}{25}$ $\quad x = 16.728$ $\quad 90 - 48 = 42°$

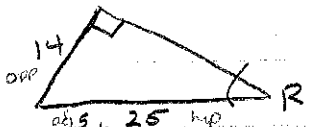
(2)



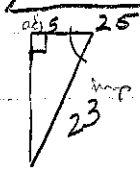
$\tan\theta = \frac{2}{20}$ $\quad \theta = 5.711°$ $\quad \tan\theta = \frac{20}{2}$ $\quad \theta = 84.289°$ $\quad c = \sqrt{20^2 + 2^2}$ $\quad c = 20.100$



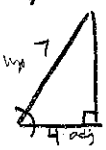
$\sin\theta = \frac{7}{12}$ $\quad \theta = 35.685°$ $\quad \cos\theta = \frac{7}{12}$ $\quad \theta = 54.315°$ $\quad b = \sqrt{12^2 - 7^2}$ $\quad b = 9.767$



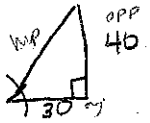
$\sin\theta = \frac{14}{25}$ $\quad \theta = 34.056°$ $\quad \cos\theta = \frac{14}{25}$ $\quad \theta = 55.944°$ $\quad b = \sqrt{25^2 - 14^2}$ $\quad b = 20.712$



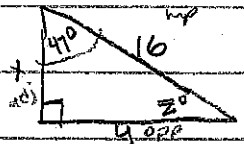
$\cos\theta = \frac{5}{23}$ $\quad \theta = 77.444°$ $\quad \sin\theta = \frac{5}{23}$ $\quad \theta = 12.556°$ $\quad b = \sqrt{23^2 - 5^2}$ $\quad b = 22.450$



$\cos\theta = \frac{4}{7}$ $\quad \theta = 55.150$ $\quad \sin\theta = \frac{4}{7}$ $\quad \theta = 34.850$ $\quad b = \sqrt{7^2 - 4^2}$ $\quad b = 5.745$



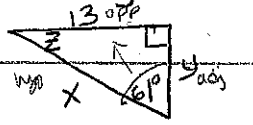
$\tan\theta = \frac{40}{30}$ $\quad \theta = 53.130$ $\quad \tan\theta = \frac{30}{40}$ $\quad \theta = 36.870$ $\quad c = \sqrt{40^2 + 30^2}$ $\quad c = 50$

3. 

$z° = 90 - 47$
$= 43°$

$\cos(47) = \frac{x}{16}$
$x = 10.912$

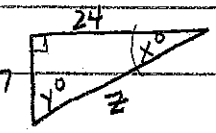
$\sin(47) = \frac{z}{16}$
$z = 11.702$



$z° = 90 - 61$
$= 29°$

$\sin(61) = \frac{13}{x}$
$x = 14.864$

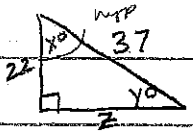
$\tan(61) = \frac{13}{y}$
$y = 7.206$



$z = \sqrt{24^2 + 7^2}$
$= 25$

$\tan(x) = \frac{7}{24}$
$x = 16.260$

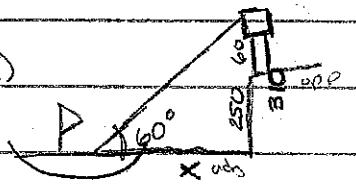
$\tan(y) = \frac{24}{7}$
$y = 73.740$



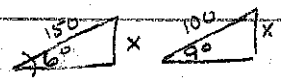
$z = \sqrt{37^2 - 22^2}$
$= 29.749$

$\cos(x) = \frac{22}{37}$
$x = 53.516$

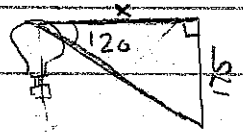
$\sin(y) = \frac{22}{37}$
$y = 36.484$

4. a) 

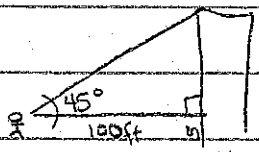
$\tan(60) = \frac{310}{x}$
$x = 178.979$ ft

b) 

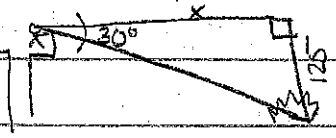
$\sin(6) = \frac{x}{150}$ $\sin(9) = \frac{x}{100}$
$x = 15.679$ + $x = 15.643$ (31.322)

c) 

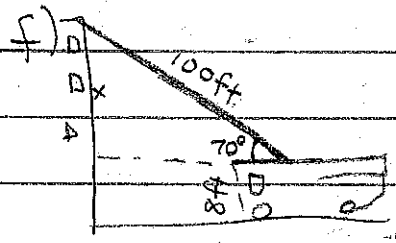
$\tan(12) = \frac{175}{x}$
$x = 823.310$

d) 

$\tan(45) = \frac{x}{100}$
$100 = x$ 105 ft

e) 

$\tan(30) = \frac{125}{x}$
$x = 216.506$

f) 

$\sin(70) = \frac{x}{100}$
$93.969 = x$ $+8$ $\rightarrow$ 101.969 ft