Trigonometry Part 2 Test Review

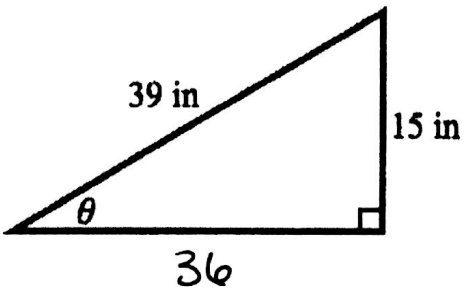
What you need to know...

- Trigonometric ratios
  - Sine
  - Cosine
  - Tangent
- Interpret word problems with angles of elevation and depression and apply trigonometric ratios
  - Eye level
  - Line of sight
- Solve triangles using the law of sines and the law of cosines
  - Law of Sines: $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$
  - Law of Cosines: $a^2 = b^2 + c^2 - 2bcCosA$ (and any variations)
- Area of a triangle without knowing its height
  - $Area = \frac{1}{2}abSinC$ (and any variations)

*For more practice, please go to Chapter 7 of your textbook!

Example problems

1. Identify the ratio for sin(θ), cos(θ) and tan(θ) in the given triangle.



$15^2 + x^2 = 39^2$

$x^2 = 39^2 - 15^2$

$x = \sqrt{39^2 - 15^2}$

$x = 36$

$\sin(\theta) = \frac{15}{39} = \frac{5}{13}$

$\cos(\theta) = \frac{36}{39} = \frac{12}{13}$

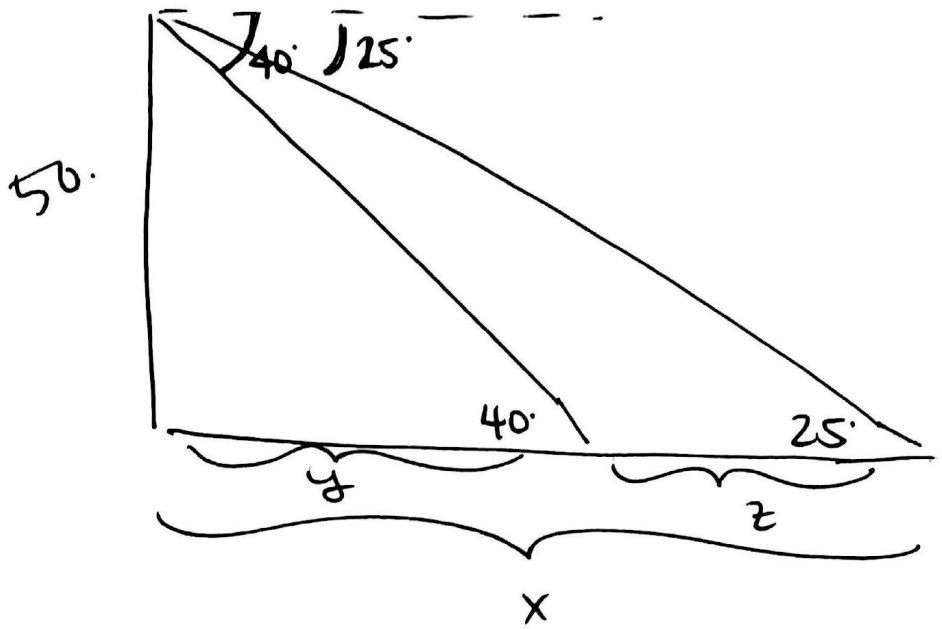
$\tan(\theta) = \frac{15}{36} = \frac{5}{12}$

2. From the top of a spire of height 50 ft, the angles of depression of two cars on a straight road at the same level as that of the base of the spire and on the same side of it are 25° and 40°. Calculate the distance between the two cars. 47.64 feet.

3. The angle of elevation of the top of a cliff from the point Q on the ground is 30°. On moving a distance of 20 m towards the foot of the cliff the angle of elevation increases to x°. If the height of the cliff is 17.3 m, then find x°.

$\boxed{60.07°}$

#2



$\tan 25 = \frac{50}{x}$

$x = \frac{50}{\tan 25}$

$x = 107.23$

$\tan 40 = \frac{50}{y}$

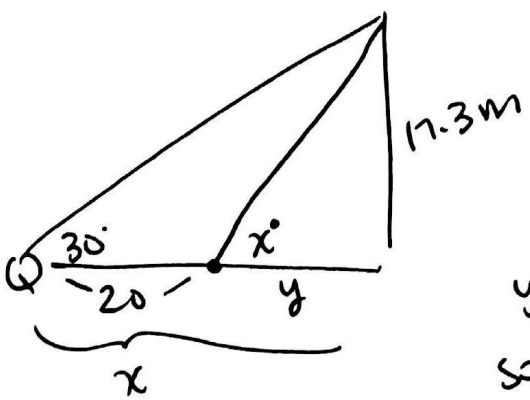
$y = \frac{50}{\tan 40}$

$y = 59.59$

$z = x - y$

$\boxed{z = 47.64 \text{ feet}}$

#3



$\tan 30 = \frac{17.3}{x}$

$x = \frac{17.3}{\tan 30}$

$x = 29.96$

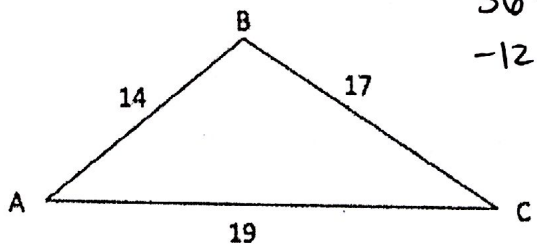
$y = 9.96 \leftarrow (29.96 - 20)$

so $\tan x^\circ = \frac{17.3}{9.96}$

$x = \tan^{-1}\left(\frac{17.3}{9.96}\right)$ $\boxed{x^\circ = 60.07^\circ}$

4. Solve the following triangles. Then find their area.

a.



$19^2 = 14^2 + 17^2 - 2(14)(17)\cos B$

$361 = 485 - 476\cos B$

$-124 = -476\cos B$

$\cos B = \frac{124}{476}$

$B = \cos^{-1}\left(\frac{124}{476}\right)$

$\boxed{B = 74.90}$

$\frac{\sin 74.90}{19} = \frac{\sin A}{17}$

$\frac{17\sin 74.90}{19} = \sin A$

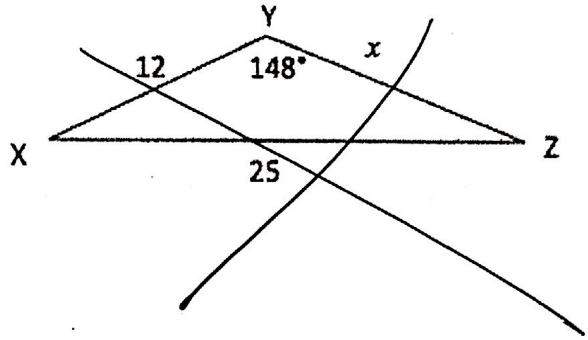
$\boxed{A = 59.75}$

$\boxed{C = 45.35}$

Area: $\frac{1}{2}(14)(17)\sin 74.90$

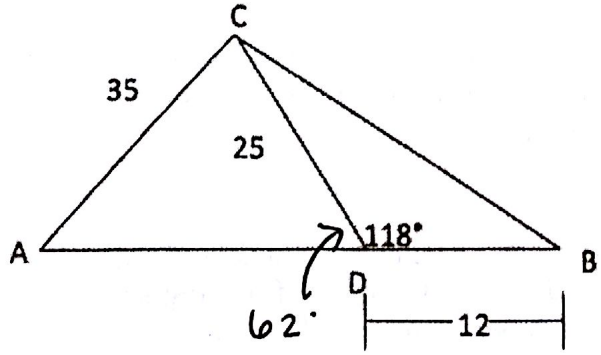
$\boxed{= 114.89 \text{ units}^2}$

b.



← not possible! Sorry! ☺

[redacted]. Find the m∠A to the nearest whole degree.



$\frac{\sin 62}{35} = \frac{\sin A}{25}$

$\frac{25\sin 62}{35} = \sin A$

$\boxed{39.10° = A}$

$\boxed{A = 39°}$