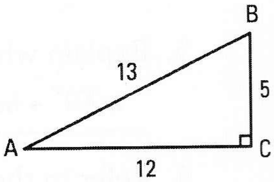
1. Consider the right triangle ABC.



a) Determine the following ratios.

1. sin A $\frac{5}{13}$ 2. cos A $\frac{12}{13}$ 3. tan A $\frac{5}{12}$

4. sec A $\frac{13}{12}$ 5. csc A $\frac{13}{5}$ 6. cot A $\frac{12}{5}$

b) Verify the trigonometric identities.

1. $\sin^2 A + \cos^2 A = 1$ $\left(\frac{5}{13}\right)^2 + \left(\frac{12}{13}\right)^2 = 1$

2. $1 + \tan^2 A = \sec^2 A$ $1 + \left(\frac{5}{12}\right)^2 = \left(\frac{13}{12}\right)^2$

3. $1 + \cot^2 A = \csc^2 A$ $1 + \left(\frac{12}{5}\right)^2 = \left(\frac{13}{5}\right)^2$

c) Verify that

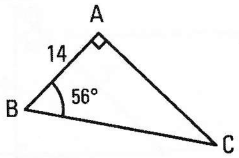
1. $\tan A = \frac{\sin A}{\cos A}$ $\frac{5}{12} = \frac{\frac{5}{13}}{\frac{12}{13}}$ 2. $\cot A = \frac{\cos A}{\sin A}$ $\frac{12}{5} = \frac{\frac{12}{13}}{\frac{5}{13}}$

d) Verify that

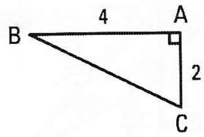
1. $\sin A = \cos B$ 2. $\cos A = \sin B$ 3. $\tan A = \cot B$

2. Solve the following triangles (round the measures of the sides and angles to the nearest tenth).

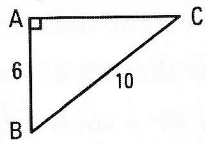
a)



b)



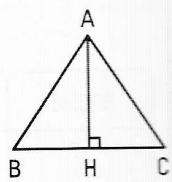
c)



a)	b)	c)
$m\overline{AC} = 20.8$	$m\overline{BC} = 4.5$	$m\overline{AC} = 8$
$m\overline{BC} = 25.0$	$m\angle B = 26.6°$	$m\angle B = 53.1°$
$m\angle C = 34°$	$m\angle C = 63.4°$	$m\angle C = 36.9°$

ACTIVITY 2 Remarkable angles: 0°, 30°, 45°, 60°, 90°

a) The triangle ABC on the right is equilateral, with each side measuring 1 unit. We have drawn the altitude AH.



1. Explain why $m\overline{BH} = 0.5$ u.
   In an equilateral triangle, the altitude AH is also a median.
2. Explain why m ∠ABC = m ∠BAC = m ∠ACB = 60°.
   In an equilateral triangle, each angle measures 60°.
3. Explain why m ∠BAH = 30°.
   In an equilateral triangle, the altitude AH is also a perpendicular bisector.
4. Refer to the triangle ABH to show that $\sin 30° = \frac{1}{2}$.
   $\sin 30° = \frac{0.5}{1} = \frac{1}{2}$