AChor/MBF3C **Name: _____**

Date: _____

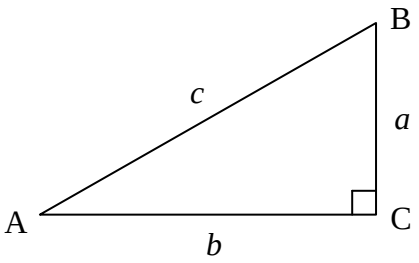
Worksheet 1-1: Trigonometric Ratios

The relationships between the acute angles and the sides of a right triangle are expressed in terms of **trigonometric ratios**. The three primary trigonometric ratios are **sine** ratio (sin), **cosine** ratio (cos), and **tangent** ratio (tan).

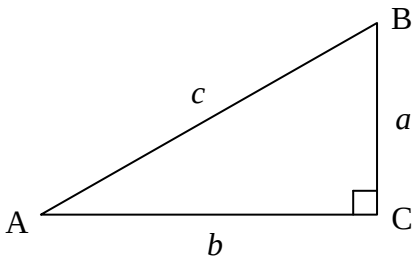
A **right triangle** is a triangle with a 90° right angle and two acute angles (less than 90°). The longest side opposite to the right angle is called the **hypotenuse** and the other two shorter sides are called the **legs**.

SOH CAH TOA:

For $\angle A$:



For $\angle B$ **:**



Note: The legs of a right triangle are labelled as opposite or adjacent relative to the acute angle of interest. They are different for different acute angles. So, first identify the acute angle of interest; then label the respective sides accordingly.

sin A $= \frac{Opposite}{Hypotenuse} =$ _____ $=$ _____	**sin B** $= \frac{Opposite}{Hypotenuse} =$ _____ $=$ _____
cos A $= \frac{Adjacent}{Hypotenuse} =$ _____ $=$ _____	**cos B** $= \frac{Adjacent}{Hypotenuse} =$ _____ $=$ _____
tan A $= \frac{Opposite}{Adjacent} =$ _____ $=$ _____	**tan B** $= \frac{Opposite}{Adjacent} =$ _____ $=$ _____

Using a Calculator:

Scientific Calculator Find the value of a trigonometric ratio: sin 40° = ? **Press 40** [SIN] [=] Find the measure of an angle: sin A = 0.5, $\angle A$ =? **Press 0.5** [2nd] [SIN] [=]	**DAL Calculator** Find the value of a trigonometric ratio: sin 40° = ? Press [SIN] 40 [=] Find the measure of an angle: sin A = 0.5, $\angle A$ =? **Press** [2nd] [SIN] **0.5** [=]

Assigned Work: WS 1-1; p. 13 #1-5

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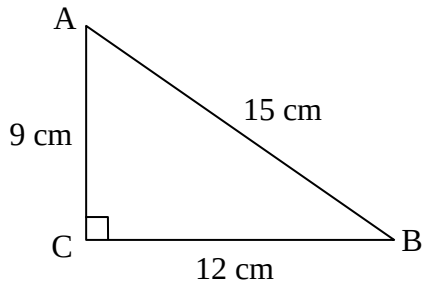
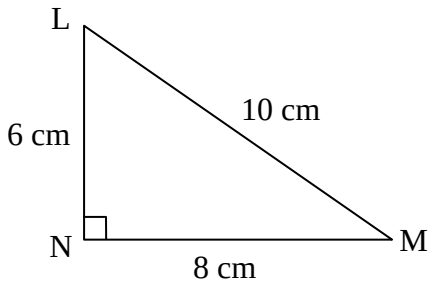
Date: _____

1. For ΔABC, find the three primary trigonometric ratios for $\angle A$.
Express each answer as a fraction in lowest terms.



2. For ΔLMN, find the three primary trigonometric ratios for $\angle M$.
Express each answer as a fraction in lowest terms.



3. Evaluate each trigonometric ratio. Round your answers to four decimal places.

(a) sin 40° **(b)** cos 50° **(c)** tan 60°

(d) sin 35° **(e)** cos 25° **(f)** tan 87°

4. Find the measure of each angle, to the nearest tenth of a degree.

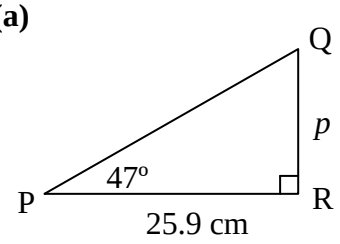
(a) cos A = 0.6789 **(b)** sin B = 0.829 **(c)** tan C = 3.7321

(d) cos X = 0.3907 **(e)** sin Y = 0.8197 **(f)** tan Z = 0.5789

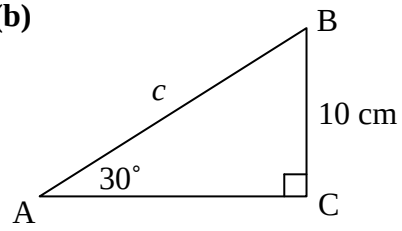
Find the Length of a Side:

5. Find each side length, to the nearest tenth of a centimetre.

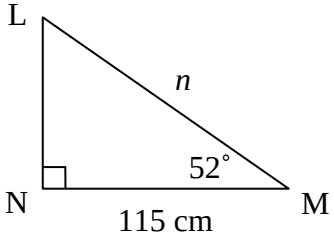
(a)



(b)



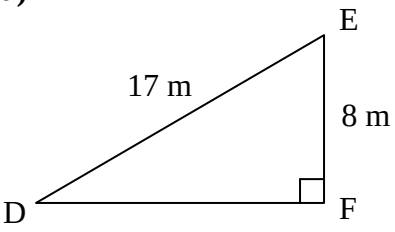
(c)



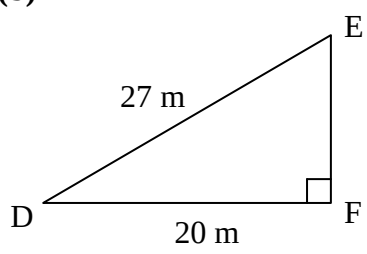
Find an Angle Given the Length of Two Sides:

6. Find the measure of $\angle D$ to the nearest degree.

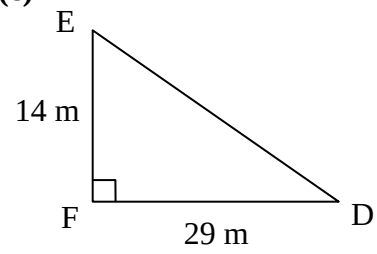
(a)



(b)



(c)



Answers: **1.** sin A = $\frac{4}{5}$, cos A = $\frac{3}{5}$, tan A = $\frac{4}{3}$**; 2.** sin M = $\frac{3}{5}$, cos M = $\frac{4}{5}$, tan M = $\frac{3}{4}$**;**
3. (a) 0.6428, (b) 0.6428, (c) 1.7321, (d) 0.5736, (e) 0.9063, (f) 19.0811**;**
4. (a) 47.2°, (b) 56°, (c) 75°, (d) 67°, (e) 55.1°, (f) 30.1°**; 5.** (a) 27.8 cm, (b) 20 cm, (c) 186.8 cm**;**
6. (a) 28°, (b) 42°, (c) 26°**.**

AChor/MBF3C

Name: _____
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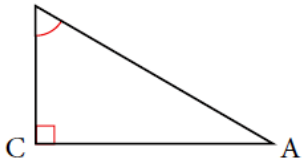
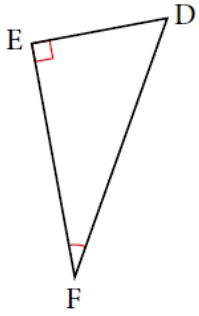
Practise

1. Name the opposite, adjacent, and hypotenuse sides associated with ∠B, ∠F, and ∠Z.

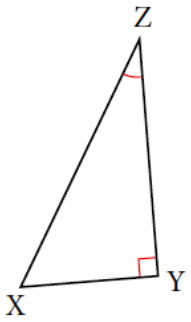
a)



b)



c)



2. Evaluate. Round your answers to four decimal places.

a) sin 30° **b)** cos 45° **c)** tan 60°

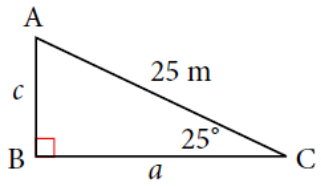
3. Find the measure of each angle to the nearest tenth of a degree.

a) sin A = 0.2345 **b)** cos B = 0.8765 **c)** tan C = 1.2345

4. a) Find the measure of side *a* to the nearest metre.

b) Find the measure of side *c* to the nearest metre.

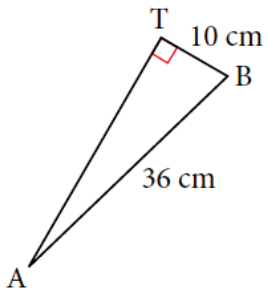
c) Find the measure of ∠A.



5. a) Find the measure of ∠A to the nearest tenth of a degree.

b) Find the measure of ∠B to the nearest tenth of a degree.

c) Find the measure of side *b* to the nearest centimetre.



Answers

1. a) opposite: AC or *b*; adjacent: BC or *a*; hypotenuse: AB or *c*
b) opposite: DE or *f*; adjacent: EF or *d*; hypotenuse: DF or *e*
c) opposite: XY or *z*; adjacent: YZ or *x*; hypotenuse: XZ or *y*

2. a) 0.5000 **b)** 0.7071 **c)** 1.7321

3. a) ∠A = 13.6° **b)** ∠B = 28.8° **c)** ∠C = 51.0°

4. a) 23 m **b)** 11 m **c)** 65°

5. a) 16.1° **b)** 73.9° **c)** 35 cm