$\qquad$
Date: $\qquad$

## Worksheet 3-3: Cosine Ratio

In a right triangle, the cosine ratio of each non-right angle is given by:

$$
\text { cosine of angle }=\frac{\text { Length of the Side Adjacent to Angle }}{\text { Length of the Hypotenuse }}=\frac{\text { adjacent }}{\text { hypotenuse }}
$$



$$
\cos \mathbf{A}=\frac{\text { Adjacent }}{\text { Hypotenuse }}=\square \quad \cos \mathbf{B}=\frac{\text { Adjacent }}{\text { Hypotenuse }}=
$$

The value of the cosine ratio for a given angle depends only on the measure of the acute angle. The value of the cosine ratio does not depend on the size of the right triangle in which the angle is found. A nonright or acute angle of a given measure has a unique cosine ratio.


## Remember:

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1. Find the cosine ratio of a given angle to $\mathbf{4}$ decimal places.

Hint: Use the $\operatorname{COS} \cos$ key on your calculator to find the cosine ratio for the given angle.
(a) $40^{\circ}$
(b) $88^{\circ}$
(c) $55^{\circ}$
2. Find the angle to the nearest degree of a given cosine ratio.

Hint: Use the $\mathbf{C O S}^{-1} 2^{\text {nd }} \cos$ key on your calculator to find the degree measure of the angle for the given cosine ratio.
(a) Find $\angle \mathrm{A}$ when $\cos \mathrm{A}=0.7821$
(b) Find $\angle \mathrm{B}$ when $\cos \mathrm{B}=0.9998$
(c) Find $\angle C$ when $\cos C=0.0349$
(d) Find $\angle \mathrm{D}$ when $\cos \mathrm{D}=0.5736$

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3. Find the angle using cosine ratio. Correct to nearest degree.


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4. Find side length with a given angle.

Correct to nearest unit.


## Solve Right Triangles Using Cosine Ratios

5. For $\triangle \mathrm{ABC}$, find the unknown angles and side lengths. Correct answers to the nearest degree or tenth of a metre.


Answers: 1. (a) 0.7660 , (b) 0.0349 , (c) 0.5736 ; 2. (a) $39^{\circ}$, (b) $1^{\circ}$, (c) $88^{\circ}$, (d) $55^{\circ}$; $3.28^{\circ}$; 4.187 m ;
5. $\angle \mathrm{A}=34^{\circ}, \angle \mathrm{C}=56^{\circ}, a=3.6 \mathrm{~m}$

