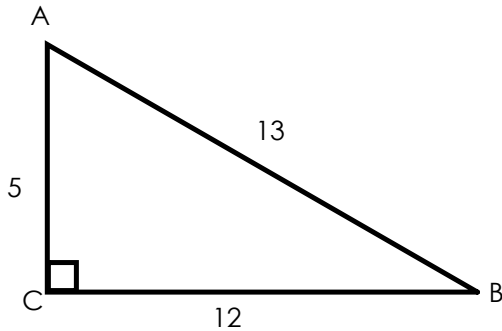


## 6.4 Cofunctions

Students will learn about cofunctions in trigonometry

### Trigonometric Cofunctions

The sine of an angle is equal to the cosine of its complement.



$$\sin \angle A = \underline{\hspace{2cm}} \quad \cos \angle B = \underline{\hspace{2cm}}$$

Key Fact



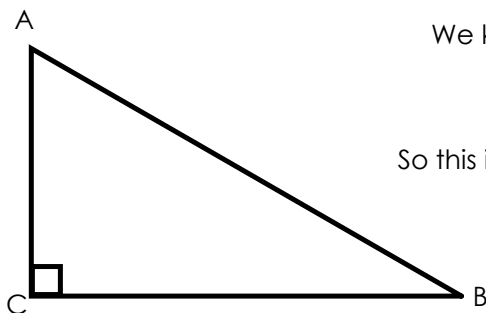
### Example Problems

If  $\sin(49) = \cos(x)$ , find the value of  $x$  that would make this statement true.

If  $A$  and  $B$  are complimentary angles, and  $\sin A = \frac{3}{5}$ , what is the  $\cos B$ ?

### Trigonometry Cofunctions Part II

Another way of saying the same thing



We know this is true

$$\sin \angle A = \cos \angle B$$

and

$$\angle B = 90 - \angle A$$

So this is also true

$$\sin A = \cos B$$
$$\sin A = \cos(90 - A)$$

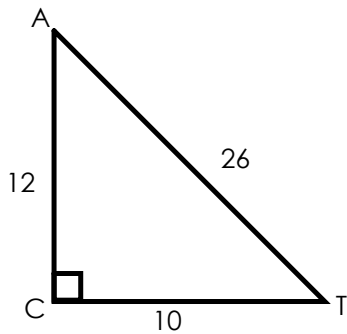
If  $\cos 72^\circ = \sin x$ , find the number of degrees in the measure of acute angle  $x$ .

In  $\triangle ABC$ , where  $\angle C$  is a right angle,  $\cos A = \frac{\sqrt{21}}{5}$ . What is  $\sin B$ ?

Which value of  $x$  satisfies the equation  $\sin(3x + 5)^\circ = \cos(4x + 1)^\circ$ ?

In right triangle  $ABC$  with the right angle at  $C$ ,  $\sin A = 2x + 0.1$  and  $\cos B = 4x - 0.7$ . Determine and state the value of  $x$ . Explain your answer.

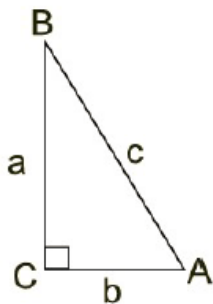
## Independent Practice



In  $\triangle CAT$ , find the  $\sin A$  and  $\cos T$ .

$\sin A = \underline{\hspace{2cm}}$                        $\cos T = \underline{\hspace{2cm}}$

Is  $\sin A = \cos T$ ?



- |  |   |
|--|---|
| 1. Express $\sin A = \underline{\hspace{2cm}}$ | 2. Express $\cos B = \underline{\hspace{2cm}}$        |
| 3. Express $\sin B = \underline{\hspace{2cm}}$ | 4. Express $\cos A = \underline{\hspace{2cm}}$        |
| 5. $m\angle C = \underline{\hspace{2cm}}$      | 6. $m\angle A + m\angle B = \underline{\hspace{2cm}}$ |

For problems a - f, find the missing value of cosine.

- a.  $\sin 20^\circ = \cos \underline{\hspace{1cm}}^\circ$               b.  $\sin 33^\circ = \cos \underline{\hspace{1cm}}^\circ$               c.  $\sin 45^\circ = \cos \underline{\hspace{1cm}}^\circ$

For questions #11 – 20, find the value of  $x$ . All problems deal with degrees.

11.  $\sin(x) = \cos 31^\circ$                       12.  $\sin 75^\circ = \cos(x)$                       13.  $\sin(x - 4) = \cos 50^\circ$

Which expression is always equivalent to  $\sin x$  when  $0^\circ < x < 90^\circ$ ?

- 1)  $\cos(90^\circ - x)$
- 2)  $\cos(45^\circ - x)$
- 3)  $\cos(2x)$
- 4)  $\cos x$

In  $\triangle ABC$ , the complement of  $\angle B$  is  $\angle A$ . Which statement is always true?

- 1)  $\tan \angle A = \tan \angle B$
- 2)  $\sin \angle A = \sin \angle B$
- 3)  $\cos \angle A = \tan \angle B$
- 4)  $\sin \angle A = \cos \angle B$

If  $x$  is a positive acute angle and  $\sin x = \cos(x + 20^\circ)$ , find the value of  $x$ .

If  $\cos(2x - 25^\circ) = \sin 55^\circ$ , find the value of  $x$ .

In  $\triangle ABC$ , where  $\angle C$  is a right angle,

$\cos A = \frac{2}{5}$ . What is  $\sin B$ ?

- 1)  $\frac{\sqrt{21}}{5}$
- 2)  $\frac{\sqrt{21}}{2}$
- 3)  $\frac{2}{5}$
- 4)  $\frac{5}{\sqrt{21}}$

In right  $\triangle ABC$ ,  $m\angle C = 90^\circ$ ,  $\cos A = \frac{1}{5}$ . What is  $\sin B$ ?

In right  $\triangle ABC$ ,  $m\angle C = 90^\circ$ ,  $\sin A = 3x - 0.6$  and  $\cos B = 4x - 0.9$ . Find  $x$ .