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Date: 2/13/18

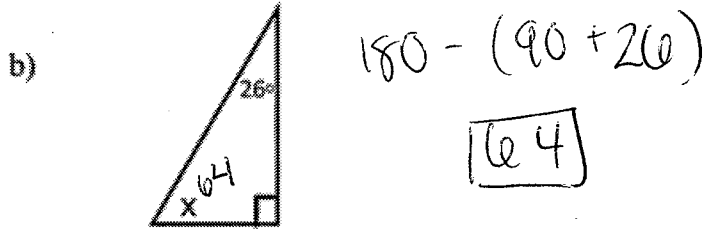
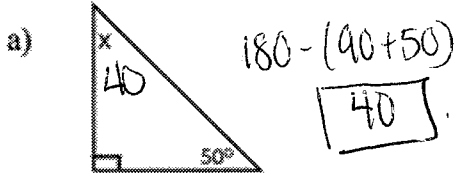
CC GEOMETRY

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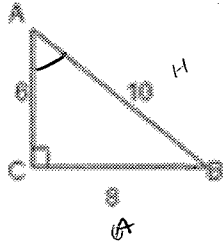
LESSON #9: COFUNCTIONS

Do Now:

1) Find the missing angles in each diagram



Determine the following:



$\sin A = \frac{6}{10} = \frac{3}{5}$

$\cos B = \frac{6}{10} = \frac{3}{5}$ (nearest degree)

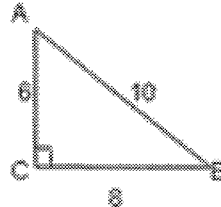
What is the measure of angle A? 53°

What is the measure of angle B? 37°

What is the relationship between these angles?

They are complementary

Determine the following:



$\sin B = \frac{6}{10} = \frac{3}{5}$

$\cos A = \frac{6}{10} = \frac{3}{5}$

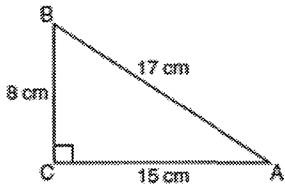
What is the measure of angle A? 53°

What is the measure of angle B? 37°

What is the relationship between these angles?

complementary

Determine the following:



$\sin A = \frac{8}{17}$

$\cos B = \frac{8}{17}$

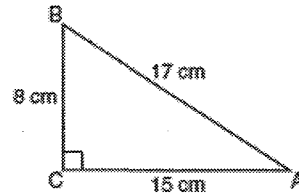
What is the measure of angle A? 28°

What is the measure of angle B? 62°

What is the relationship between these angles?

complementary

Determine the following:



$\sin B = \frac{15}{17}$

$\cos A = \frac{15}{17}$

What is the measure of angle A? 28°

What is the measure of angle B? 62°

What is the relationship between these angles?

complementary

SINE AND COSINE OF COMPLEMENTARY ANGLES

If A and B are complementary angles,

$$\sin A = \cos B$$

$$\cos A = \sin B$$

When $0^\circ < \theta < 90^\circ$, $\sin(90^\circ - \theta) = \cos \theta$ and $\sin \theta = \cos(90^\circ - \theta)$

Therefore, sine and cosine are called COFUNCTIONS !

For questions 1-6, find values for θ that make each statement true:

<p>1. $\sin \theta = \cos 25^\circ$</p> $90 - 25 = \boxed{65 = \theta}$	<p>2. $\sin 80^\circ = \cos \theta$</p> $80 + \theta = 90$ $\boxed{\theta = 10}$
<p>3. $\sin \theta = \cos(\theta + 10)^\circ$</p> $\theta + \theta + 10 = 90$ $2\theta + 10 = 90$ $2\theta = 80$ $\boxed{\theta = 40}$	<p>4. $\sin(\theta - 45)^\circ = \cos \theta$</p> $\theta - 45 + \theta = 90$ $2\theta - 45 = 90$ $2\theta = 135$ $\boxed{\theta = 67.5}$
<p>5. $\cos x^\circ = \sin(x + 20)^\circ$</p> $x + x + 20 = 90$ $2x + 20 = 90$ $2x = 70$ $\boxed{x = 35}$	<p>6. $\sin\left(\frac{y}{3} + 10\right)^\circ = \cos y^\circ$</p> $\frac{1y}{3} + 10 + y = 90$ $\frac{4y}{3} + 10 = 90$ $\frac{4y}{3} = 80$ $4y = 240$ $\boxed{y = 60}$

7. Which of the following pairs of values are equivalent?

$\sin 17^\circ, \cos 73^\circ$

$\sin 58^\circ, \cos 58^\circ$

$\sin 64^\circ, \sin 26^\circ$

$\sin 145^\circ, \sin 35^\circ$

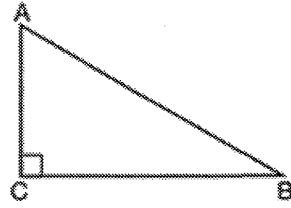
8. In scalene triangle $\triangle ABC$ shown in the diagram below, $m\angle C = 90^\circ$. Which equation is always true?

1) $\sin A = \sin B$

2) $\cos A = \cos B$

3) $\cos A = \sin C$

4) $\sin A = \cos B$



YOU TRY!

36 54
 *1. If $\sin 6A = \cos 9A$, then $m\angle A$ is equal to

- 1) ~~36~~
- 2) 36
- 3) 54
- 4) $1\frac{1}{2}$

$$6A + 9A = 90$$

$$15A = 90$$

$$A = 6$$

2. If $\cos(x - 10) = \sin(4x)$, a value of x is

- 1) 10
- 2) 20
- 3) 30
- 4) 40

$$x - 10 + 4x = 90$$

$$5x - 10 = 90$$

$$5x = 100$$

$$x = 20$$

36 54
 3. If $\sin 2A = \cos 3A$, then $m\angle A$ is

- 1) $1\frac{1}{2}$
- 2) 5
- 3) 18
- 4) 36

$$2A + 3A = 90$$

$$5A = 90$$

$$A = 18$$

4. If $\cos(2x - 1)^\circ = \sin(3x + 6)^\circ$, then the value of x is

- 1) -7
- 2) 17
- 3) 35
- 4) 71

$$2x - 1 + 3x + 6 = 90$$

$$5x + 5 = 90$$

$$5x = 85$$

$$x = 17$$

5. If $\sin(x + 20^\circ) = \cos x$, the value of x is

- 1) 35°
- 2) 45°
- 3) 55°
- 4) 70°

$$x + 20 + x = 90$$

$$2x + 20 = 90$$

$$2x = 70$$

$$x = 35$$

