Trig – Sin/Cos Relationship **Name:** Key

What does complementary mean?

Use your calculator to find the value of the following (Round to the nearest 3 decimals):

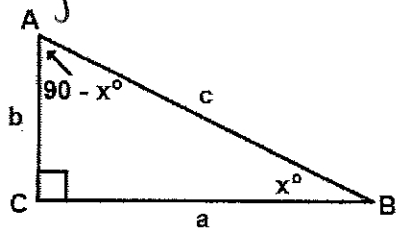
1. Sin 30° = .5 Cos 60° = .5
2. Cos 21° = .934 Sin 69° = .934
3. Cos 38° = .788 Sin 52° = .788
4. Sin 45° = .707 Cos 45° = .707

Based on the above calculations, what do you think Sin 13° would be equivalent to? Cos 77°

Can you come up with a rule that would work every time? sin/cos functions that are complementary are congruent.

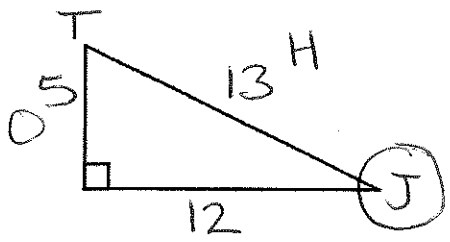
Sin / Cos Relationship

Sin A = cos (90 – A) Sin Θ = cos (90 – Θ)
Cos A = sin (90 – A) Cos Θ = sin (90 – Θ)



Using the Sin / Cos relationship:

1. If Angle T and Angle J are complementary angles in a right triangle and Sin T = $\frac{12}{13}$, what is Sin J?

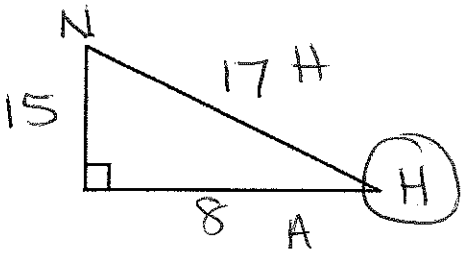


$12^2+x^2=13^2$
$144+x^2=169$
$-144 \quad -144$
$x^2=25$
$x=\sqrt{25}=5$

$\sin T=\frac{O}{H}=\frac{12}{13}$

$\sin J=\frac{O}{H}=\frac{5}{13}$

2. If Angle N and Angle H are complementary angles in a right triangle and Cos N = $\frac{15}{17}$, what is Cos H?

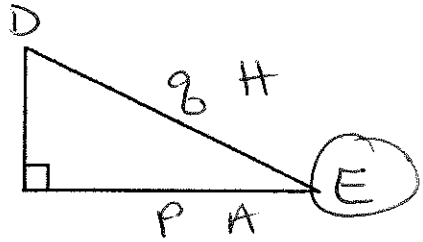


$15^2+x^2=17^2$
$225+x^2=289$
$-225 \quad -225$
$x^2=64$
$x=\sqrt{64}=8$

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

$\cos H=\frac{A}{H}=\frac{8}{17}$

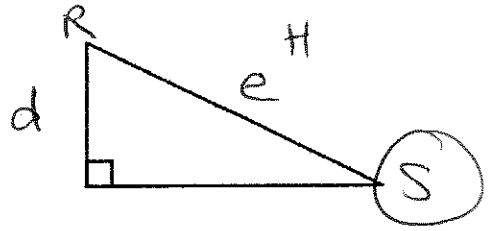
3. Angle D and E are complementary angles. If Sin D = $\frac{p}{q}$, what is Cos E?



$\sin D=\frac{O}{H}=\frac{p}{q}$

$\cos E=\frac{A}{H}=\frac{p}{q}$

4. Angle R and S are complementary angles. If Cos R = $\frac{d}{e}$, what is Sin S?



$\cos R = \frac{A}{H} = \frac{d}{e}$

$\sin S = \frac{O}{H} = \frac{d}{e}$

5. In ΔABC, the $m\angle B = 90^0$. For what value of x does $\sin(x - A) = \cos A$?

a. 0^0 b. 45^0 c. 90^0 d. 180^0

6. Which of the following is equivalent to Cos 35^0?

a. Sin 35^0 b. Sin 55^0 c. Cos 55^0 d. Sin 145^0

7. Which of the following is equivalent to Sin 50^0?

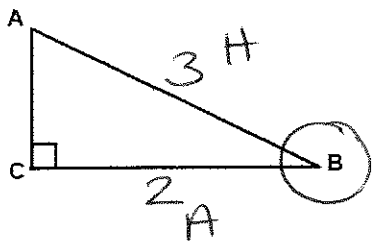
a. Cos 50^0 b. Sin 40^0 c. Cos 40^0 d. Cos 130^0

8. Which of the following is equivalent to Sin 15^0?

a. Cos 15^0 b. Sin 75^0 c. Cos 75^0 d. Sin 15^0

9. If the Sin A = 2/3, what is the Cos B? = $\frac{A}{H}$

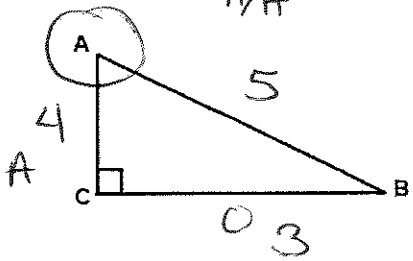
O/H



$\frac{2}{3}$

10. If the Cos A = 4/5, what is the Tan A? = $\frac{O}{A} = \frac{3}{4}$

A/H



$4^2 + x^2 = 5^2$

$16 + x^2 = 25$

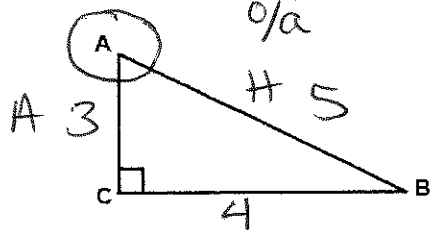
$-16 \quad -16$

$x^2 = 9$

$x = \sqrt{9} = 3$

11. If the Tan A = 4/3, what is the Cos A? = $\frac{A}{H} = \frac{3}{5}$

O/A



$3^2 + 4^2 = c^2$

$9 + 16 = c^2$

$25 = c^2$

$\sqrt{25} = c$

$5 = C$