

Trigonometric Ratios

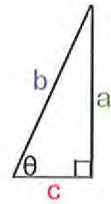
A trigonometric ratio is a ratio of two sides of a right triangle.

The trig ratios are:
sine, cosine and tangent

Sine $\sin\theta = \frac{\text{opposite}}{\text{hypotenuse}} = \frac{a}{b}$

Cosine $\cos\theta = \frac{\text{adjacent}}{\text{hypotenuse}} = \frac{c}{b}$

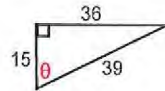
Tangent $\tan\theta = \frac{\text{opposite}}{\text{adjacent}} = \frac{a}{c}$



SOH - CAH - TOA
 Sine opposite hypotenuse
 Cosine adjacent hypotenuse
 Tangent opposite adjacent

Ex. 1

Find all 3 trig ratios.
 Write the ratios as fractions
 AND as decimals rounded to the nearest thousandth.

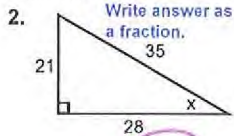


$\sin\theta = \frac{O}{H} = \frac{36}{39} = 0.923$

$\cos\theta = \frac{A}{H} = \frac{15}{39} = 0.385$

$\tan\theta = \frac{O}{A} = \frac{36}{15} = 2.4$

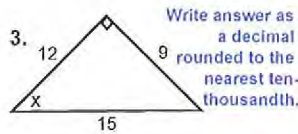
Ex: Find the trig ratios for the angle.



$\sin x = \frac{21}{35}$

$\cos x = \frac{28}{35}$

$\tan x = \frac{21}{28}$



$\sin x = \frac{9}{15} = 0.6$

$\cos x = \frac{12}{15} = 0.8$

$\tan x = \frac{9}{12} = 0.75$

SUMMARY:

What are the 3 trigonometric ratios?
sine, cosine, tangent

What are each of the trig ratios defined as?

$\sin = \frac{\text{opp}}{\text{hyp}}$

$\cos = \frac{\text{adj}}{\text{hyp}}$

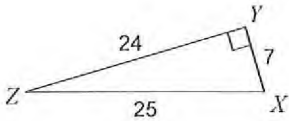
$\tan = \frac{\text{opp}}{\text{adj}}$

Trigonometric Ratios

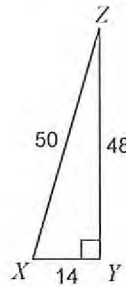
Practice Problems

Find the value of each trigonometric ratio.

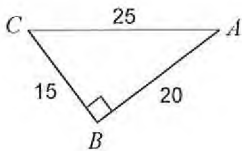
1) $\tan Z$



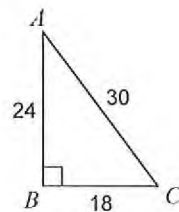
2) $\tan X$



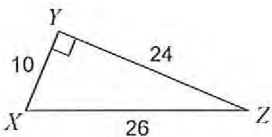
3) $\tan A$



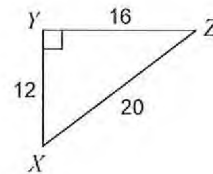
4) $\sin A$



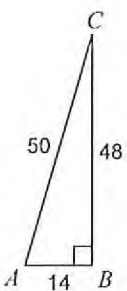
5) $\sin Z$



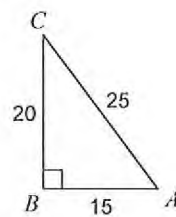
6) $\cos X$



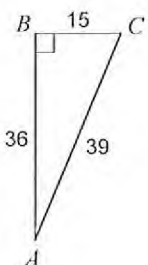
7) $\sin C$



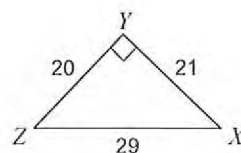
8) $\cos A$



9) $\cos A$

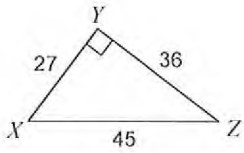


10) $\tan X$

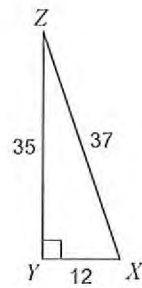


Find the value of each trigonometric ratio to the nearest ten-thousandth.

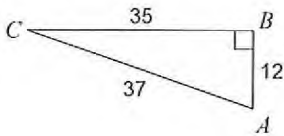
11) $\tan Z$



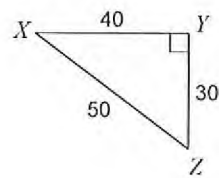
12) $\sin X$



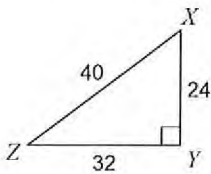
13) $\tan C$



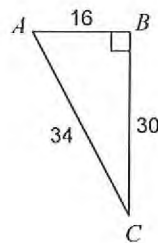
14) $\sin Z$



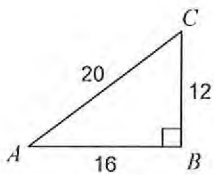
15) $\sin Z$



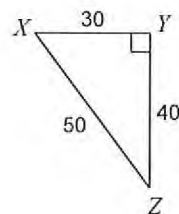
16) $\sin C$



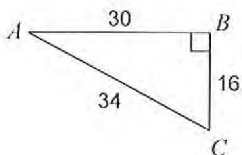
17) $\cos C$



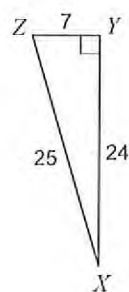
18) $\cos Z$



19) $\cos A$



20) $\tan X$

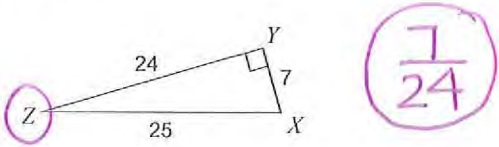


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Practice Problems

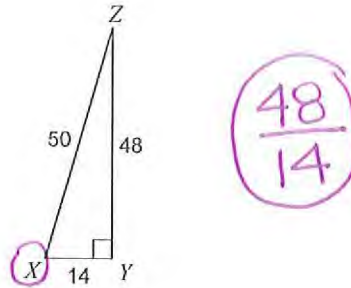
Find the value of each trigonometric ratio.

1) $\tan Z$



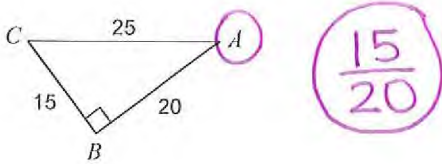
$\frac{7}{24}$

2) $\tan X$



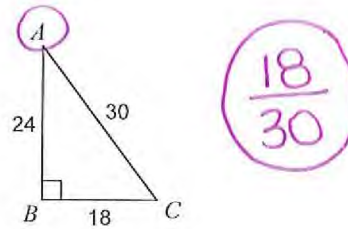
$\frac{48}{14}$

3) $\tan A$



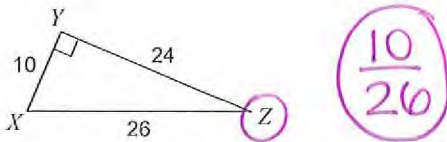
$\frac{15}{20}$

4) $\sin A$



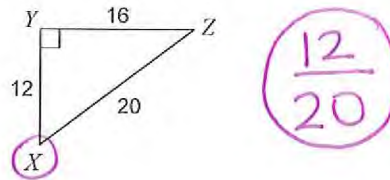
$\frac{18}{30}$

5) $\sin Z$



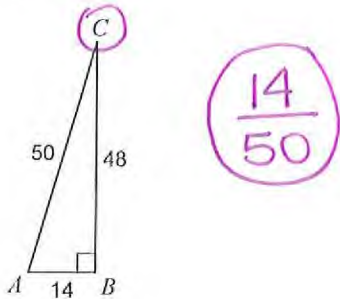
$\frac{10}{26}$

6) $\cos X$



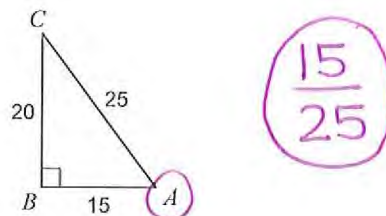
$\frac{12}{20}$

7) $\sin C$



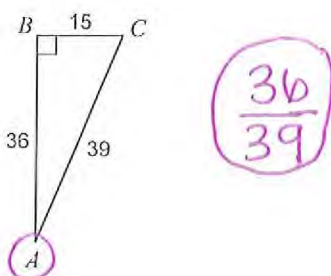
$\frac{14}{50}$

8) $\cos A$



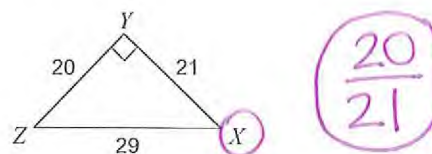
$\frac{15}{25}$

9) $\cos A$



$\frac{36}{39}$

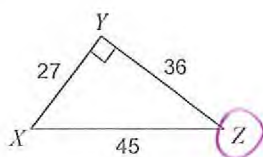
10) $\tan X$



$\frac{20}{21}$

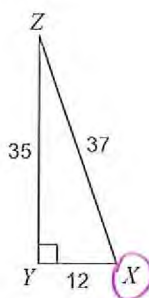
Find the value of each trigonometric ratio to the nearest ten-thousandth.

11) $\tan Z$



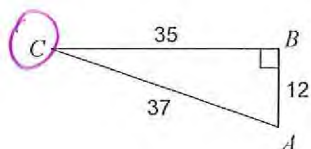
$$\frac{27}{36} = 0.75$$

12) $\sin X$



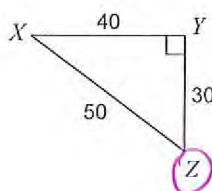
$$\frac{35}{37} = 0.9459$$

13) $\tan C$



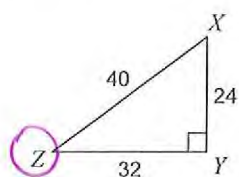
$$\frac{12}{35} = 0.3429$$

14) $\sin Z$



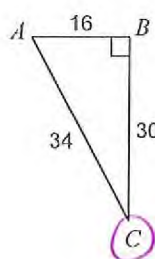
$$\frac{40}{50} = 0.8$$

15) $\sin Z$



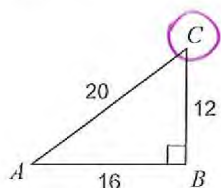
$$\frac{24}{40} = 0.6$$

16) $\sin C$



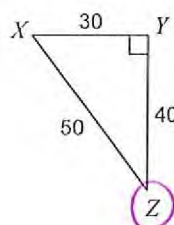
$$\frac{16}{34} = 0.4706$$

17) $\cos C$



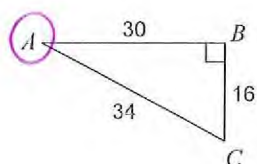
$$\frac{12}{20} = 0.6$$

18) $\cos Z$



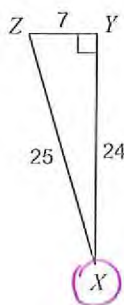
$$\frac{40}{50} = 0.8$$

19) $\cos A$



$$\frac{30}{34} = 0.8824$$

20) $\tan X$



$$\frac{7}{24} = 0.2917$$