

Pre-calculus
4-1a
1/2/08

Warm-up

Pick a car and determine the tire size:

<http://www.tirerack.com/>

Speedometers are calibrated with the original tires. Aftermarket tires (of different sizes) compromise the speedometer (and odometer).

How many revolutions per hour does the tire make when traveling 60 mph?

$D = 23'' \quad C = 23\pi \text{ in}$

$$\frac{60 \text{ mi}}{1} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} = \frac{3,801,600 \text{ in}}{1 \text{ hr}}$$

$$\frac{3,801,600 \text{ in}}{23\pi \text{ in/rev}} = 52612.5 \text{ revolutions}$$

Nov 30-7:17 AM

Pick a new tire.

$D = 28.3''$

60 miles = 52812.5 rev

What is your actual speed when the speedometer reads 60 mph?

73.8 mph

Dec 3-7:29 AM

Right Triangle Trigonometry

side $\theta = \frac{\text{opp}}{\text{hyp}}$ - opposite/hypotenuse

side $\theta = \frac{\text{adj}}{\text{hyp}}$ - adjacent/hypotenuse

side $\theta = \frac{\text{opp}}{\text{adj}}$ - opposite/adjacent

Dec 3-7:44 AM

$\sin C = \frac{24}{25}$

$\cos C = \frac{7}{25}$

$\tan C = \frac{24}{7}$

$\csc C = \frac{25}{24}$

$\sec C = \frac{25}{7}$

$\cot C = \frac{7}{24}$

$c = 24$
 $a = 25$
 $t = 7$

Jan 4-12:07 PM

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

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

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

$\text{cosecant } \theta = \csc \theta = \frac{1}{\sin \theta} = \frac{\text{hyp}}{\text{opp}}$

$\text{secant } \theta = \sec \theta = \frac{1}{\cos \theta} = \frac{\text{hyp}}{\text{adj}}$

$\text{cotangent } \theta = \cot \theta = \frac{1}{\tan \theta} = \frac{\text{adj}}{\text{opp}}$

Jan 4-12:08 PM