MATH 10-C Trigonometry

How tall do you think the post is?

Feb 12-6:41 PM

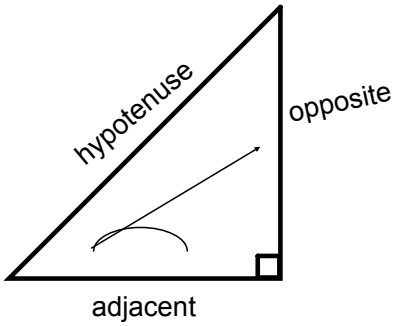
Angle Size:				Opp/Hyp		Adj/Hyp		Opp/Adj	
Triangle	Length of Opp	Length of Adj	Length of Hyp	Fraction	Decimal	Fraction	Decimal	Fraction	Decimal
1									
2									
3									
4									
5									
6									
7									
8									
Mean Values (Decimal)									
Geogebra Values									
Comments:									

Feb 20-8:15 AM

http://www.geogebratube.org/student/m35573

Feb 19-8:18 AM

3.1 The Tangent Ratio



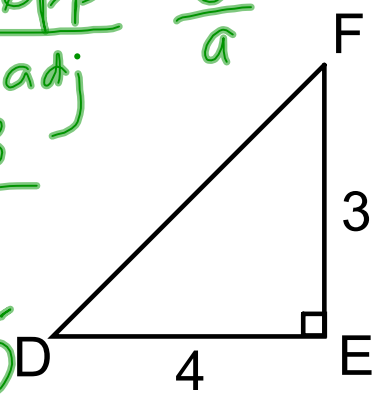
$$Tan\theta = \frac{opposite}{adjacent}$$

There are three ratios we use to determine the measure of an angle: Tangent, Sine, and Cosine.

Feb 12-4:50 PM

Find tan D and tan F in triangle DEF

$TanD = \frac{EF}{DE}$ opp/adj o/a $TanF = \frac{\square}{\square}$



TanD = 3/4 opp

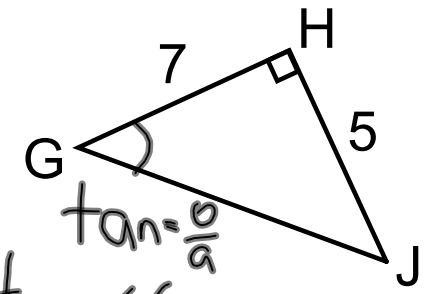
TanD = 0.75

What is adj ∠D?

How are the ratios related?

Feb 12-5:04 PM

Find tan∠G and tan∠J. Then find their angle measures.



tan = o/a

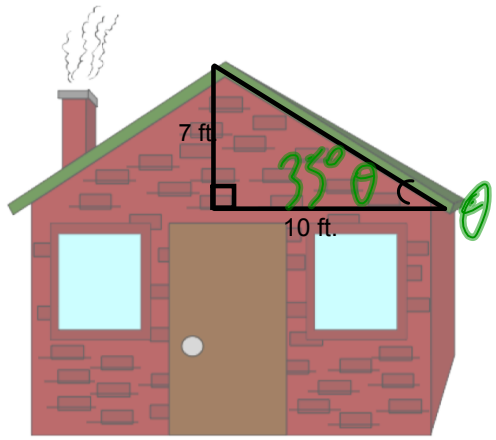
tan∠G = 5/7

∠G = tan⁻¹(5/7)

∠G = 35.5°

Feb 12-5:10 PM

Determine the angle of inclination of the roof of this house to the nearest degree.

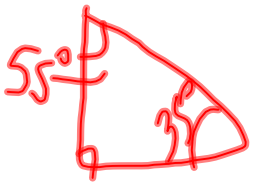


$\tan\theta = \frac{o}{a} = \frac{7}{10}$

$\tan\theta = \frac{7}{10}$

$\theta = \tan^{-1}(7/10)$

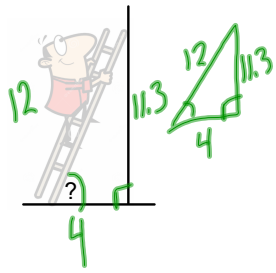
$\theta = 35°$



Feb 12-5:33 PM

A 12 ft. ladder leans against the side of a building, with it's base 4 ft. from the wall.

What angle, to the nearest degree, does the ladder make with the ground?



$a^2+b^2=c^2$

$c^2-a^2=b^2$

$12^2-4^2=b^2$

$b = 11.3$ ft

$\tan\theta = \frac{o}{a} = \frac{11.3}{4}$

$\theta = \tan^{-1}\left(\frac{11.3}{4}\right)$

$\theta = 71°$

Feb 12-6:12 PM

Practice: Pg 107 #1-5

Oct 23-2:10 PM

Using the tangent ratio to calculate lengths

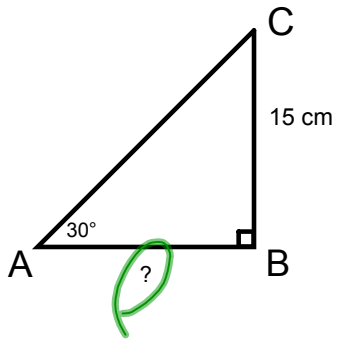
$$Tan\theta = \frac{opposite}{adjacent}$$

$$adjacent = \frac{opposite}{tan\theta}$$

$$opposite = adjacent \times tan\theta$$

Feb 12-6:27 PM

Determine side length AB



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

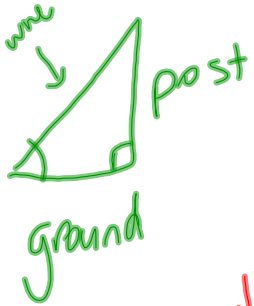
$\tan 30° = \frac{15}{AB}$

$AB = 26cm$

$AB = \frac{15}{\tan 30°}$

Feb 12-6:32 PM

A guy wire helps support a tower. The angle between the wire and the level ground is 62°. One end of the wire is 12.3 m from the base of the tower. How high up the tower does the wire reach, to the nearest tenth of a metre?



$\tan = \frac{o}{a}$

$\times 12.3 \quad \tan 62° = \frac{h}{12.3} \quad \times 12.3$

$12.3(\tan(62°)) = h$

$h = 23.1m$

Feb 12-6:35 PM

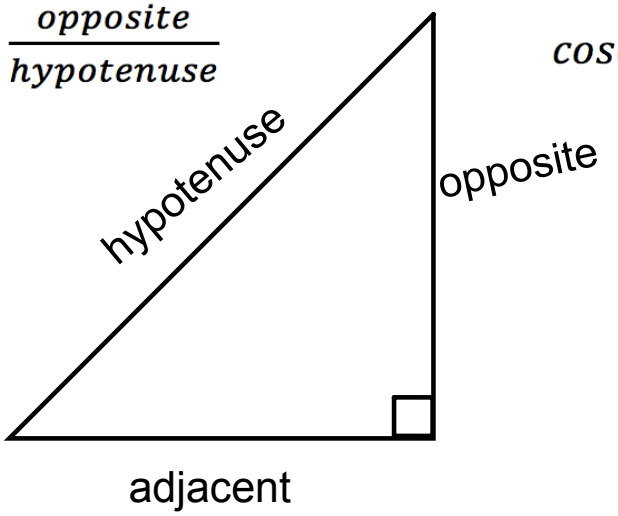
HMWK: Pg. 107 #6, 9, 10, 12, 16
(And #1-5 from last class)

Feb 12-6:25 PM

3.2 The Sine and Cosine Ratios

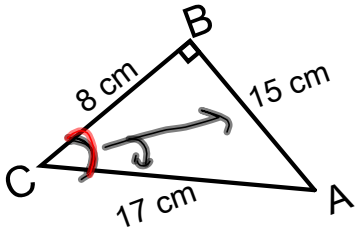
$$\sin\theta = \frac{opposite}{hypotenuse}$$

$$\cos\theta = \frac{adjacent}{hypotenuse}$$



Feb 12-7:15 PM

Determine the Sine and Cosine of ∠C, then find the angle measure of ∠C



$sinC = \frac{opposite}{hypotenuse}$ $cosC = \frac{adjacent}{hypotenuse}$

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

$C = \sin^{-1}\left(\frac{15}{17}\right)$

$C = 61.9°$

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

$C = \cos^{-1}\left(\frac{8}{17}\right)$

$C = 61.9°$

$\tan = \frac{o}{a}$

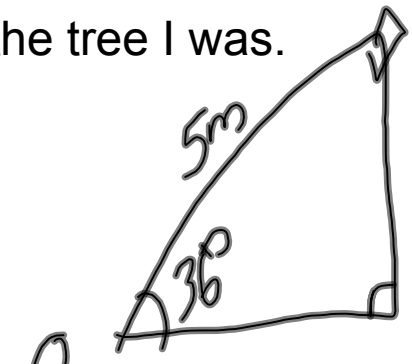
$\tan C = \frac{15}{8}$

$C = \tan^{-1}\left(\frac{15}{8}\right)$

$C = 61.9°$

Feb 12-8:57 PM

I would use the **cosine law** if my kite got stuck in the top of a tree and I knew that my kite string was released 5 m and my clinometer showed the angle of inclination to be 36° and I wanted to know how far from the tree I was.



of

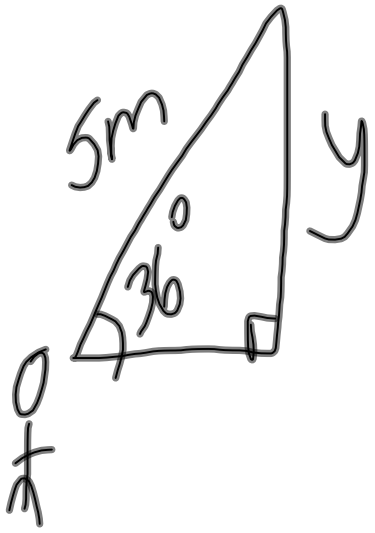
$\cos = \frac{a}{h}$

$\cos 36° = \frac{x}{5}$ ×5

$5\cos 36° = x = 4.04$ m

Feb 18-12:59 PM

I would use the **sine law** if my kite got stuck in the top of a tree and I knew that my kite string was released 5 m and my clinometer showed the angle of inclination to be 36° and I wanted to know how tall the tree I was so I could decide if I could safely climb up and get the kite.



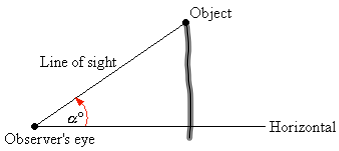
$\sin = \frac{o}{h}$

$\sin 36^\circ = \frac{y}{5m}$

$5m(\sin 36^\circ) = y = 2.93m$

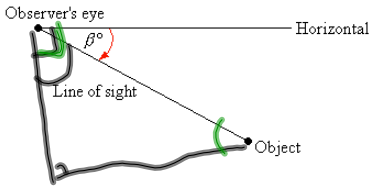
Feb 18-12:59 PM

Angle of inclination of an object as seen by an observer is the angle between the horizontal and the line from the object to the observer's eye (the line of sight).



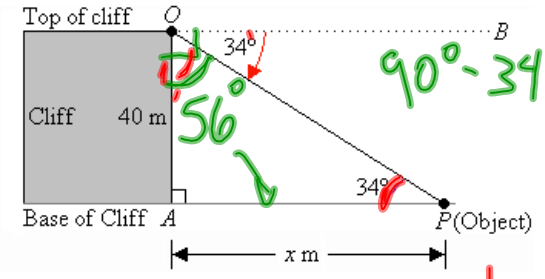
If the object is below the level of the observer, then the angle between the horizontal and the observer's line of sight is called the

Angle of depression

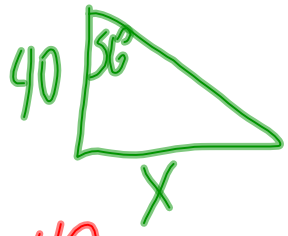


Nov 16-4:22 PM

From the top of a vertical cliff 40 m high, the **angle of depression** of an object that is level with the base of the cliff is 34°. How far is the object from the base of the cliff?



$90° - 34° = 56°$



$\tan 56° = \frac{x}{40}$

$40 \tan 56° = x$

$x \approx 59.3\text{m}$

$\tan 34° = \frac{40}{x}$

$x = \frac{40}{\tan 34} \approx 59.3\text{m}$

Nov 16-4:26 PM

Sine and Cosine

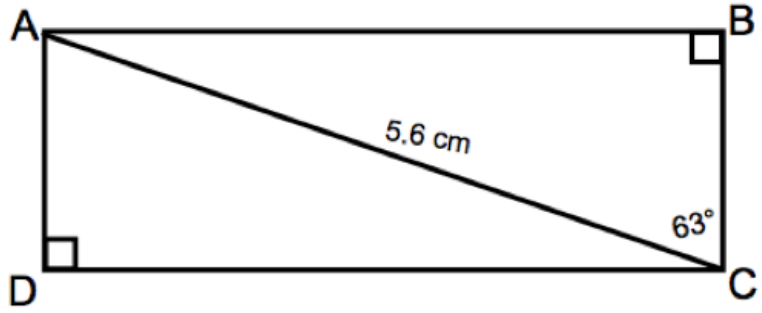
HMWK: Pg.120 #3ace, 4, 5, 6, 7, 10, 15

Feb 12-9:16 PM

3.3. Solving Right Triangles

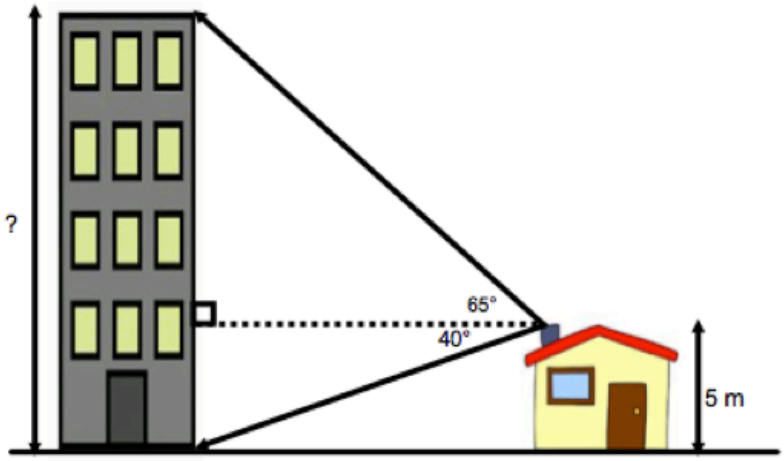
Feb 12-9:34 PM

1. Use the rectangle below to find the following:
   a) Determine the area of the rectangle to the nearest tenth of a square centimeter.
   b) What percentage of the total rectangle area does triangle ABC take?
   c) What is the area of triangle ADC?



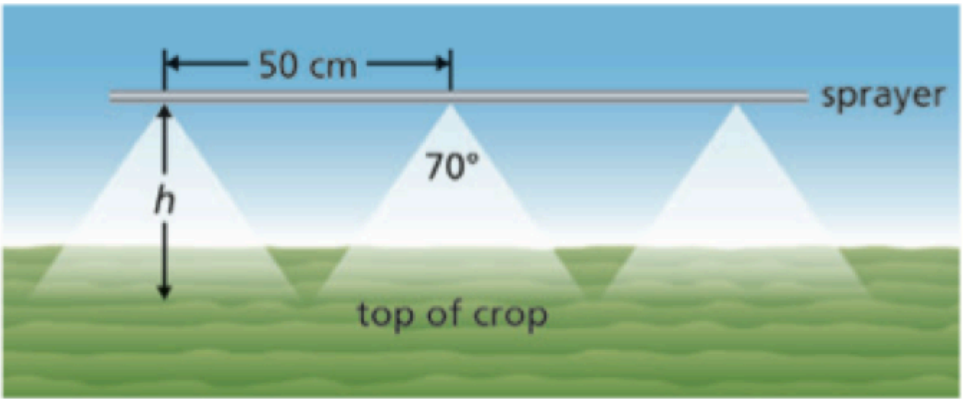
Nov 21-10:49 AM

2. Determine the height of the taller building.



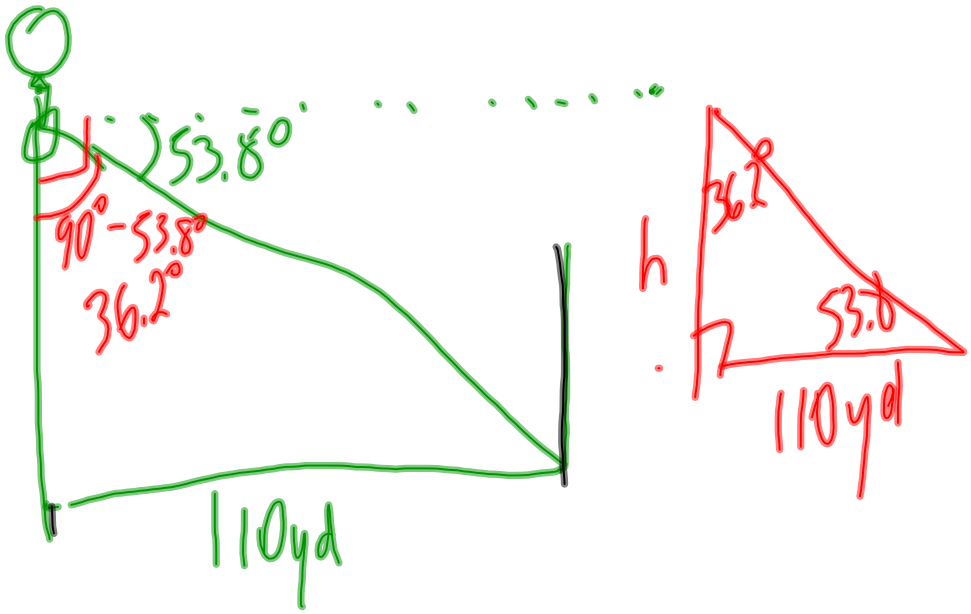
Feb 12-10:39 PM

3. To irrigate crops, a farmer uses a boom sprayer pulled by a tractor. The nozzles are 50 cm apart and spray at an angle of 70°. To the nearest centimetre, how high should the sprayer be placed above the crops to ensure that all the crops are watered?



Nov 21-10:50 AM

A balloonist uses an empty football field for his landing area. When the balloon is directly over the goal post, he measures the angle of depression to the base of the other goal post to be 53.8°. Given that the distance between goal posts in a Canadian football field is 110 yd, determine the height of the balloon.



Oct 23-3:20 PM

HMWK: Pg. 131 #1a, 2, 4, 5ace, 7, 11, 14

Feb 12-10:52 PM

Nov 24-11:20 AM