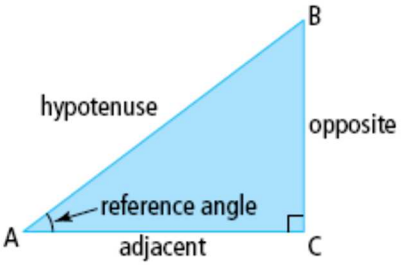
FMP10 Name: _____

Date: _____

2.2 Sine & Cosine Ratios



Like tangent, sine & cosine are ratios that compare side lengths in a right triangle.

$$\sin A = \frac{\text{length of side opposite } \angle A}{\text{length of hypotenuse}}$$

$$\cos A = \frac{\text{length of side adjacent to } \angle A}{\text{length of hypotenuse}}$$

$\sin A = \frac{opp}{hyp} = \frac{o}{h}$

$\cos A = \frac{adj}{hyp} = \frac{a}{h}$

$\tan A = \frac{opp}{adj} = \frac{o}{a}$

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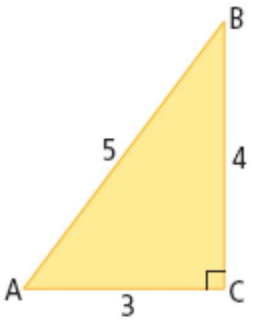
Ex. Write Trigonometric Ratios

Write each trigonometric ratio.

a) $\sin A = \frac{4}{5}$

b) $\cos A = \frac{3}{5}$

c) $\tan A = \frac{4}{3}$



d) $\sin B = \frac{3}{5}$

e) $\cos B = \frac{4}{5}$

f) $\tan B = \frac{3}{4}$

Ex.

a) Evaluate each ratio, to four decimal places.

$\sin 42° = 0.6691$

$\cos 68° = 0.3746$

b) Determine each angle measure, to the nearest degree.

$\sin \theta = 0.4771$

$\theta = \sin^{-1}(0.4771)$

$= 28.4\ldots$

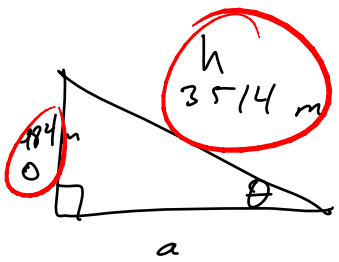
$= 28°$

$\cos \beta = 0.7225$

$\beta = \cos^{-1}(0.7225)$

$= 44°$

Ex. In the World Cup Downhill held at Panorama Mountain Village in British Columbia, the skiers raced 3514 m down the mountain. If the vertical height of the course was 984 m, determine the average angle of the ski course with the ground. Express your answer to the nearest tenth of a degree.



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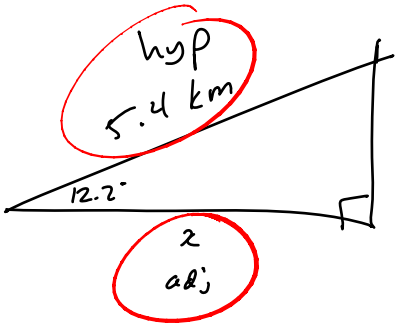
$\sin\theta = \frac{984}{3514}$

$\theta = \sin^{-1}\left(\frac{984}{3514}\right)$

$= 16.3°$

Ex. A pilot starts his takeoff and climbs steadily at an angle of 12.2°. Determine the horizontal distance the plane has travelled when it has climbed 5.4 km along its flight path. Express your answer to the nearest tenth of a kilometre.



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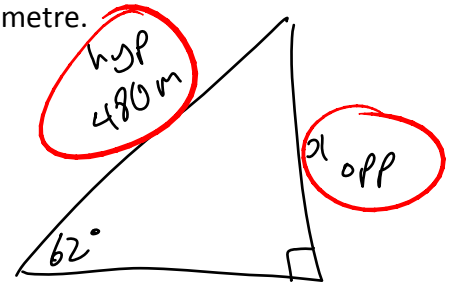
$\cos 12.2° = \frac{x}{5.4}$

$x = 5.4 \cos 12.2$

$= 5.3$ km

Ex. Determine the height of a kite above the ground if the kite string extends 480 m from the ground and makes an angle of 62° with the ground. Express your answer to the nearest tenth of a metre.



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$\sin 62° = \frac{x}{480}$

$x = 480 \sin 62$

$= 423.8$ m

Practice pg. 120/ # 1→6, 8→12, 14, 15