

Trigonometry Review

Review Questions: p.416 # 2, 3, 5, 6, 9, 13, 14, 16  
p.453 # 2, 3, 7, 8, 11, 12

Tools:

- Pythagorean Theorem
- Angle Sum Theorem ( $=180^\circ$ )
- Similar Triangles
- Primary Trig Ratios
- Sine Law
- Cosine Law

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We can show similarity by:

- (a) side-side-side similarity (SSS~)
- (b) angle-angle similarity (AA~)
- (c) side-angle-side similarity (SAS~)

If  $\triangle ABC$  is similar to  $\triangle XYZ$ , we write:  $\triangle ABC \sim \triangle XYZ$

Then:

- corresponding sides are proportional (i.e., the ratios are equal)

$$\text{Sides: } \frac{AB}{XY} = \frac{BC}{YZ} = \frac{AC}{XZ}$$

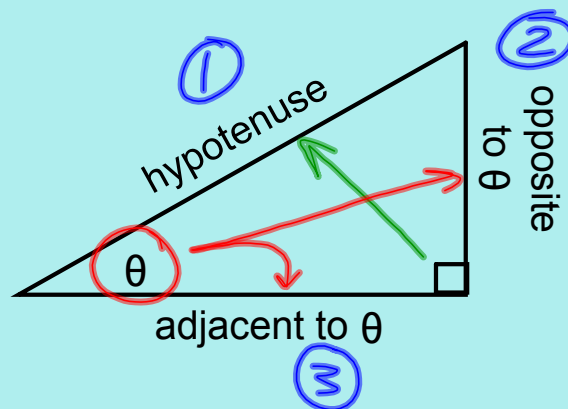
- corresponding angles are equal.

$$\begin{aligned}\text{Angles: } & \angle A = \angle X \\ & \angle B = \angle Y \\ & \angle C = \angle Z\end{aligned}$$

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For any angle of interest, there are three (3) primary trigonometric ratios.

$$\begin{aligned}\text{sine of } \theta &= \frac{\text{opposite}}{\text{hypotenuse}} \\ \text{cosine of } \theta &= \frac{\text{adjacent}}{\text{hypotenuse}} \\ \text{tangent of } \theta &= \frac{\text{opposite}}{\text{adjacent}}\end{aligned}$$



S o h C a h T o a

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Sine Law

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

Cosine Law

$$a^2 = b^2 + c^2 - 2bc \cos A \quad \cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

To solve a triangle means to determine the lengths of all unknown sides and the measures of all unknown angles.

right-Δ

- trig
- AST
- Pyth.

non-right Δ

- sine law or cosine law
- AST
- cosine law or sine law

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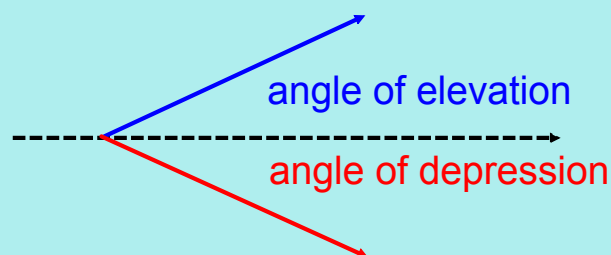
Steps for solving problems:

- 1) Sketch a diagram
- 2) Identify the unknown (what are you looking for?)
- 3) Decide on a triangle(s) that you can use to determine the unknown.
- 4) Identify the tool/method you will use.
- 5) Solve

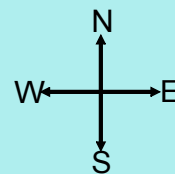
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Angle of Elevation (or Inclination): the angle measured above the horizontal.

Angle of Depression (or Declination): the angle measured below the horizontal.



A compass direction is measured from N, S, E, or W. The angles are always between  $0^\circ$  and  $90^\circ$ .



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Formulae on test:

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

$$\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$$

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

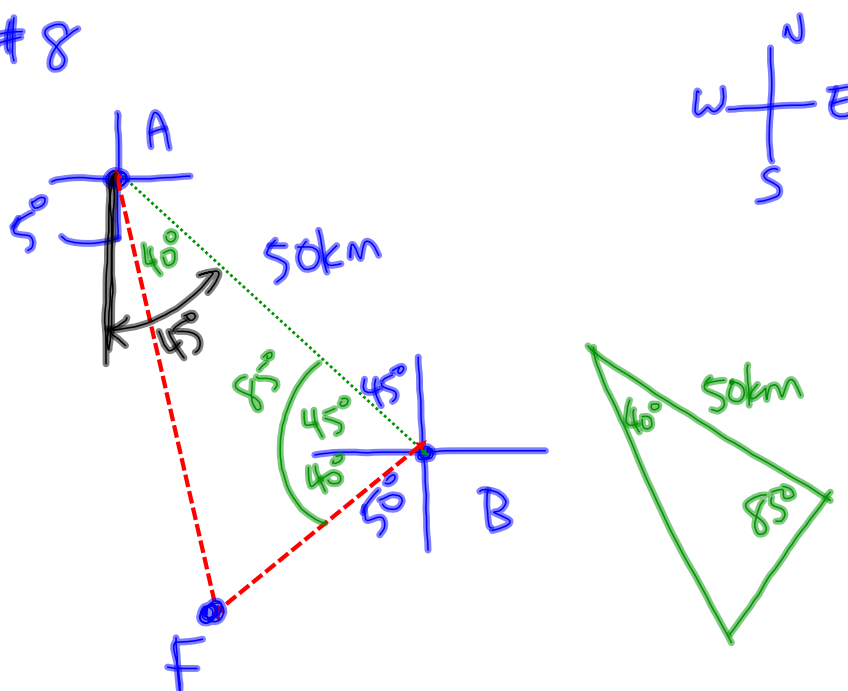
$$a^2 = b^2 + c^2 - 2bc \cos A$$

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

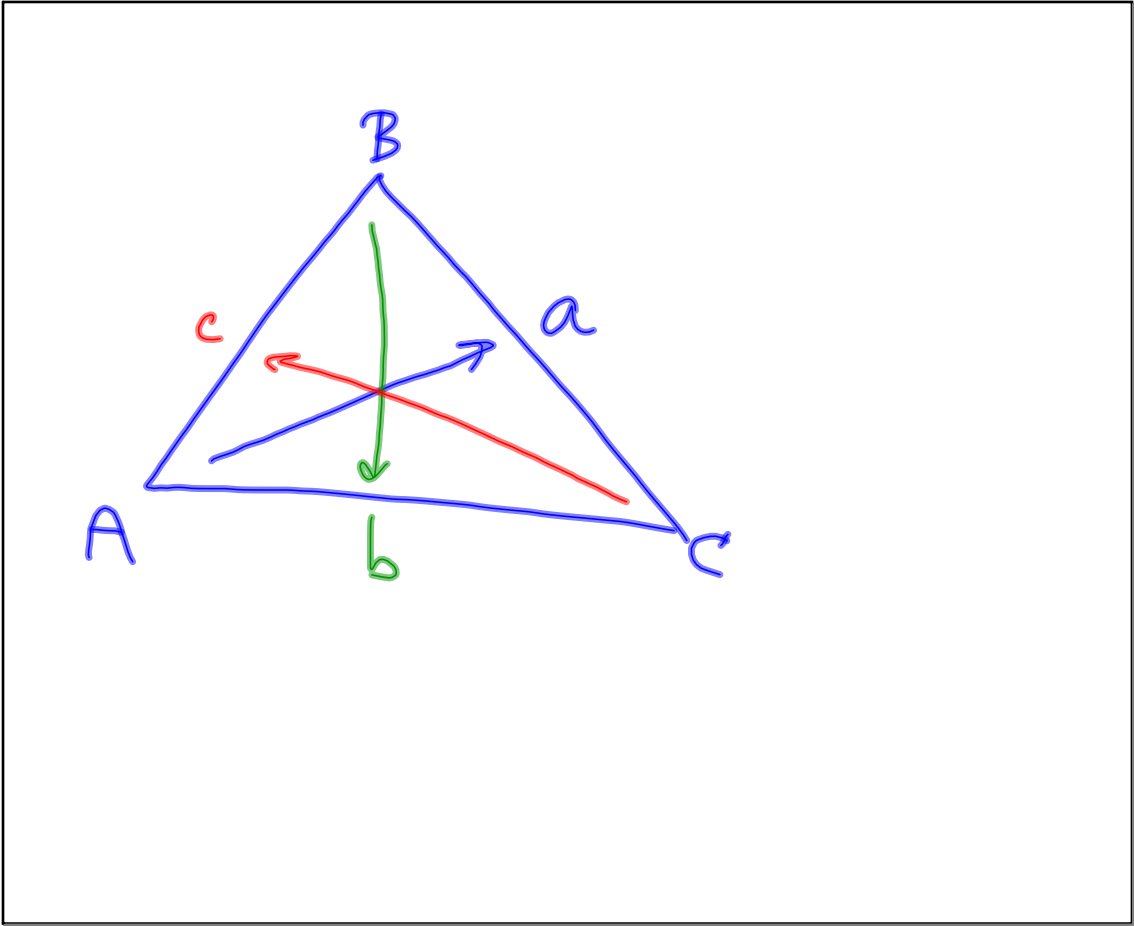
$$\cos A = \frac{b^2 + c^2 - a^2}{2bc}$$

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p.450 # 8



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