

Unit 3 Similar Triangles and Right Triangle Trig Review

Triangle Proportionality

If a line parallel to one side of the triangle intersects the other two sides, then it divides the two sides proportionally.

Find the Length of DE

$$\frac{AB}{BC} = \frac{AD}{DE}$$

$$\frac{7}{9} = \frac{3.9}{DE}$$

$$3 \cdot 9 = 7 \cdot DE$$

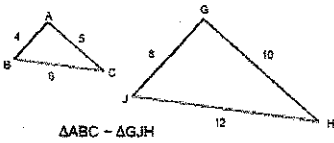
$$27 = 7 \cdot DE$$

$$3.9 \approx DE$$

Similar Triangles

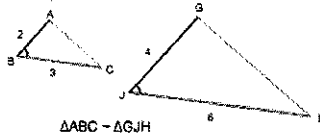
Side-Side-Side (SSS) Similarity Theorem

- If the corresponding sides of two triangles are proportional, then the triangles are similar.



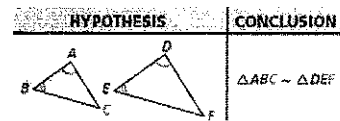
Side-Angle-Side (SAS) Similarity Theorem

- If an angle of one triangle is congruent to an angle of a second triangle and the sides including the two angles are proportional, then the triangles are similar.



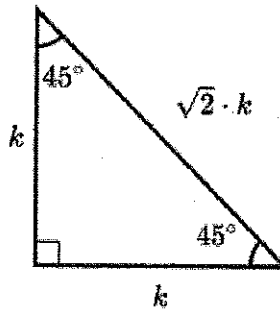
Angle-Angle (AA) Similarity Postulate

- If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar.

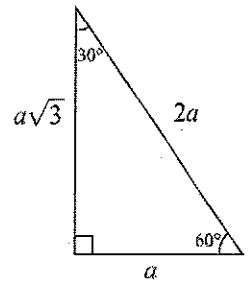


Special Right Triangles

45°	45°	90°
x	x	$x\sqrt{2}$



30°	60°	90°
x	$x\sqrt{3}$	2x



Right Triangle Trig

Pythagorean Theorem: $a^2 + b^2 = c^2$

$$\sin A = \frac{\text{opp}}{\text{hyp}} = \frac{a}{c}$$

$$\sin B = \frac{\text{opp}}{\text{hyp}} = \frac{b}{c}$$

$$\cos A = \frac{\text{adj}}{\text{hyp}} = \frac{b}{c}$$

$$\cos B = \frac{\text{adj}}{\text{hyp}} = \frac{a}{c}$$

$$\tan A = \frac{\text{opp}}{\text{adj}} = \frac{a}{b}$$

$$\tan B = \frac{\text{opp}}{\text{adj}} = \frac{b}{a}$$

Remember: These are called trig ratios ^^

Solving Trigonometric Equations

There are only three possibilities for the placement of the variable 'x'.

$\sin \angle X = \frac{\text{Opp}}{\text{Hyp}}$ $\sin \angle X = \frac{12}{25}$ $\sin \angle X = 0.48$ $X = \sin^{-1}(0.48)$ $X = 28.6854^\circ$	$\sin \angle = \frac{y}{\text{hyp}}$ $\sin 25^\circ = \frac{x}{12}$ $0.4226 \times \frac{x}{12}$ $x = (12)(0.4226)$ $x = 5.04 \text{ cm}$	$\sin \angle = \frac{\text{Opp}}{x}$ $\sin 25^\circ = \frac{12}{x}$ $0.4226 \times \frac{12}{x}$ $x = \frac{12}{0.4226}$ $x = 28.4 \text{ cm}$
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Remember: When solving for the missing angle, we use trig inverses.

\sin^{-1} \cos^{-1} \tan^{-1}

Remember: When solve trig word problems that the angle of depression is equal to the angle of elevation.

