

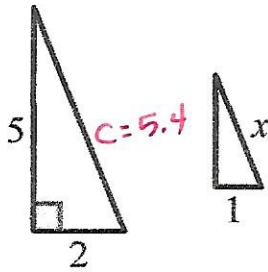
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**SECONDARY MATH II**  
**Module 6 Study Guide: Similarity & Right Triangle Trigonometry**

**Directions:** Show ALL work. Round any decimals to one decimal place, unless otherwise stated.

For 1-3: Find the missing side for the similar shapes that are shown below.

1.



$$2^2 + 5^2 = c^2$$

$$\sqrt{29} = \sqrt{c^2}$$

$$5.4 = c$$

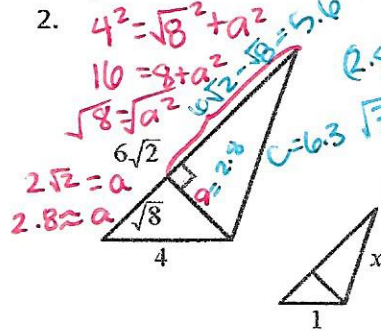
$$\frac{2}{1} = \frac{5.4}{x}$$

$$2x = 5.4(1)$$

$$\frac{2x}{2} = \frac{5.4}{2}$$

$$x = 2.7$$

2.



$$4^2 = 6^2 + a^2$$

$$16 = 36 + a^2$$

$$\sqrt{8} = \sqrt{a^2}$$

$$2.8 \approx a$$

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$$c = 6.3$$

$$(2.8)^2 + (5.6)^2 = c^2$$

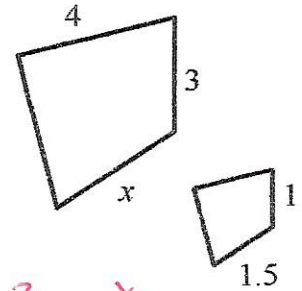
$$\sqrt{39.2} = \sqrt{c^2}$$

$$6.3 = c$$

$$\frac{4}{1} = \frac{6.3}{x}$$

$$\frac{4x}{4} = \frac{6.3(1)}{4}$$

$$x = 1.6$$



$$\frac{3}{1} = \frac{x}{1.5}$$

$$1x = 3(1.5)$$

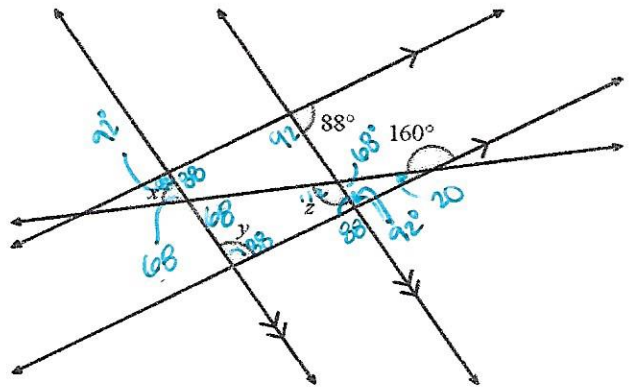
$$x = 4.5$$

4. Find the measurements of angles x, y, z.

$$\angle z = 112^\circ$$

$$\angle y = 88^\circ$$

$$\angle x = 68^\circ$$



5. Find the measure of all of the angles for the quadrilateral below, given  $\Delta ABC$  to the right.

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

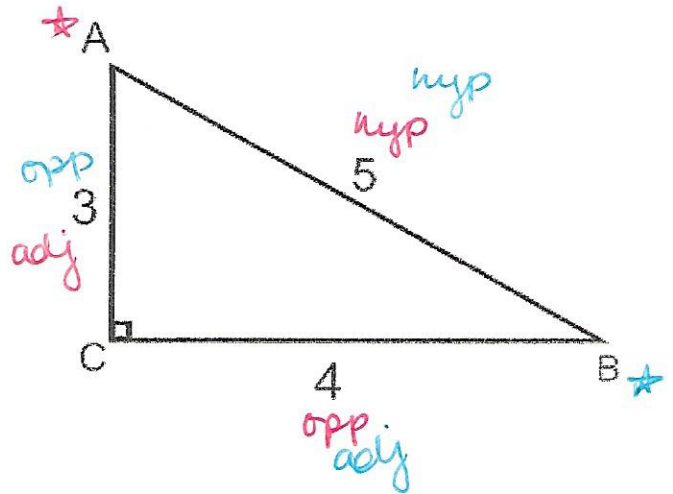
$$\cos A = \frac{3}{5}$$

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

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

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

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



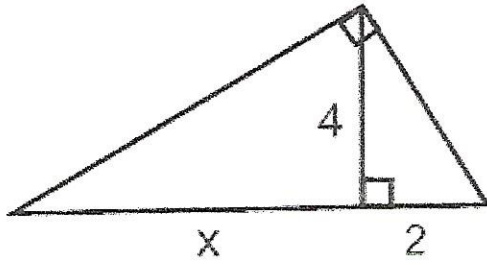
6. Set up a proportion and solve for x.

$$\frac{4}{x} = \frac{2}{4}$$

$$2x = 4(4)$$

$$\frac{2x}{2} = \frac{16}{2}$$

$$x = 8$$



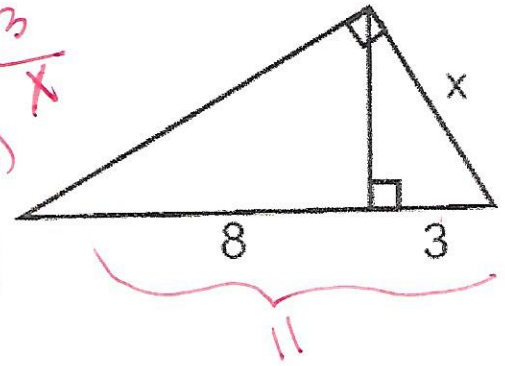
7. Set up a proportion and solve for x.

$$\frac{x}{11} = \frac{3}{x}$$

$$x^2 = 3(11)$$

$$\sqrt{x^2} = \sqrt{33}$$

$$x = 5.7$$



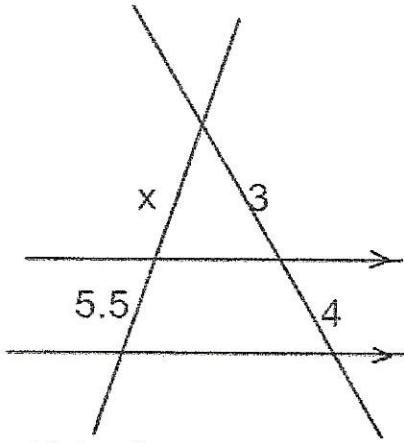
8. Set up a proportion and solve for x.

$$\frac{3}{x} = \frac{4}{5.5}$$

$$4x = 3(5.5)$$

$$\frac{4x}{4} = \frac{16.5}{4}$$

$$x = 4.1$$

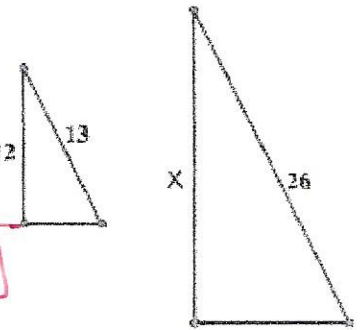


9. Set up a proportion and solve for x.

$$\frac{13}{24} = \frac{12}{x}$$

$$13x = 312$$

$$x = 24$$



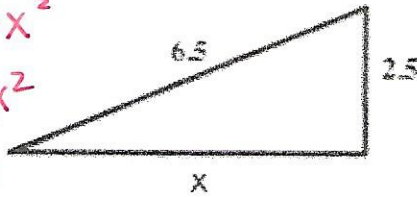
10. Find the missing side length, x.

$$(6.5)^2 = (2.5)^2 + x^2$$

$$42.25 = 6.25 + x^2$$

$$\sqrt{36} = \sqrt{x^2}$$

$$6 = x$$



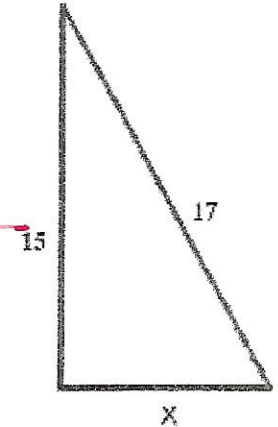
11. Find the missing side length, x.

$$x^2 + 15^2 = 17^2$$

$$x^2 + 225 = 289$$

$$\sqrt{x^2} = \sqrt{64}$$

$$x = 8$$



12. Find the coordinates of the midpoint, M, of a line segment between (0,6) and (8,2).

$$M = \left( \frac{0+8}{2}, \frac{6+2}{2} \right) = \left( \frac{8}{2}, \frac{8}{2} \right)$$

$$M = (4, 4)$$

13. Find the coordinates of the midpoint, M, of a line segment between (-4,5) and (3,-6).

$$M = \left( \frac{-4+3}{2}, \frac{5+(-6)}{2} \right) = \left( \frac{-1}{2}, \frac{-1}{2} \right)$$

$$M = \left( -\frac{1}{2}, -\frac{1}{2} \right)$$

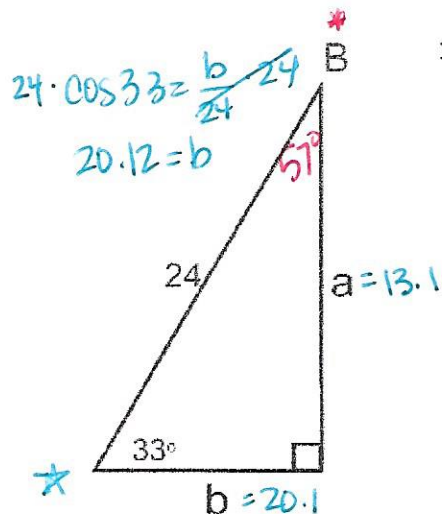
$$\angle B = 180 - 90 - 33 = 57$$

14. Find all missing side lengths and angle measures.

$$m\angle B = 57^\circ$$

$$a = 13.1$$

$$b = 20.1$$

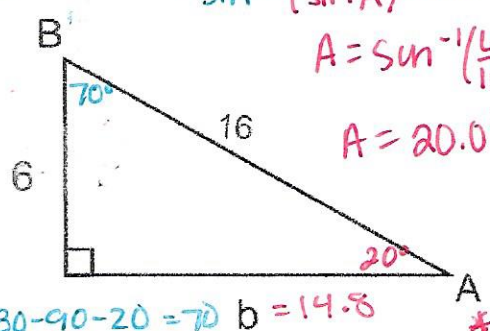


15. Find all missing side lengths and angle measures.

$$m\angle A = 20^\circ$$

$$m\angle B = 70^\circ$$

$$b = 14.8$$



$$\angle B = 180 - 90 - 20 = 70 \quad b = 14.8$$

Find the missing angle or side length given the trigonometric ratio below.

16.  $\sin B = 0.67$

$$\sin^{-1}(\sin B) = \sin^{-1}(0.67)$$

$$B = \sin^{-1}(0.67)$$

$$B = 42.1^\circ$$

17.  $17 \cdot \cos(53^\circ) = \frac{x}{5} \cdot 6$

$$6 \cdot \cos 53 = x$$

$$3.6 = x$$

18.  $\tan A = 1.2$

$$\tan^{-1}(\tan A) = \tan^{-1}(1.2)$$

$$A = \tan^{-1}(1.2)$$

$$A = 50.2^\circ$$

$$6^2 + b^2 = 16^2$$

$$36 + b^2 = 256$$

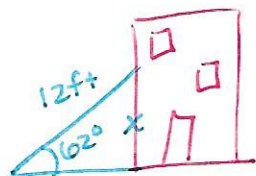
$$-36 \quad -36$$

$$b^2 = 220$$

$$b = 14.8$$

For the following, draw a picture, set up a trig ratio, and solve for the missing angle or side length.

19. John places a 12 foot ladder against the side of a building. If the ladder makes an angle of elevation with the ground of  $62^\circ$ , how far up the side of the building is the ladder?

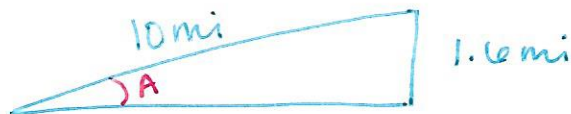


$$12 \cdot \sin 62 = \frac{x}{12} \cdot 12$$

$$12 \cdot \sin 62 = x$$

$$10.6 \text{ ft} = x$$

20. In southern Utah, there is a 10 mile stretch of I-15 that increases 1.6 miles. What is the angle of elevation?



$$\sin A = \frac{1.6}{10}$$

$$\sin^{-1}(\sin A) = \sin^{-1}\left(\frac{1.6}{10}\right)$$

$$A = \sin^{-1}\left(\frac{1.6}{10}\right)$$

$$A = 9.2^\circ$$