

# 7.1 Quiz Key

Monday, December 15, 2008  
8:57 AM

## Precalculus Quiz 3-1 Hungerford 7.1—Right Triangles and Beyond!

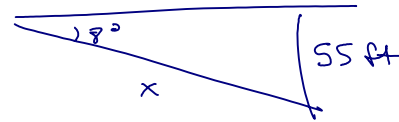
Name: \_\_\_\_\_ Per: \_\_\_\_\_  
December 12, 2008

For each problem, draw a LABELED diagram (with #s and variables) and answer the stated question to the nearest 0.01.

1. In a highway reconstruction scheme, an exit ramp must descend 55 feet at an angle of depression of no more than  $8^\circ$ . How long must it be?

$$\sin 8^\circ = \frac{55 \text{ ft}}{x} \Rightarrow x = \frac{55 \text{ ft}}{\sin 8^\circ}$$

$$\approx \boxed{395.19 \text{ ft}}$$



2. An isosceles triangle has a base of length 80 and an area of 1200. What is the measure of one of its base angles?

$$\frac{1}{2} \cdot 80 \cdot h = 1200 \Rightarrow h = 30$$

$$\tan \theta = \frac{h}{40} = \frac{30}{40} = \frac{3}{4}$$

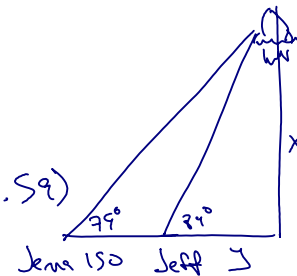
$$\theta = \tan^{-1} \left( \frac{3}{4} \right) \approx \boxed{36.87^\circ}$$



3. Jeff and Jenna stand 150 feet apart to observe a test shot of Mr. Kinderman's newest  $H_2$ -powered rocket; Jeff is between Jenna and the rocket (so gallant!). The rocket rises to an angle of elevation of  $84^\circ$  from Jeff and  $79^\circ$  from Jenna. How high up did it fly?

$$\begin{cases} \tan 84^\circ = \frac{x}{y} \\ \tan 79^\circ = \frac{x}{y+150} \end{cases} \Rightarrow (x, y) \approx (1680.18, 176.59)$$

$$\boxed{1680.18 \text{ ft}}$$

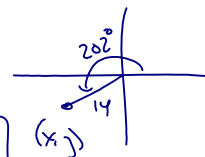


4. A point is 14 units away from the origin at an angle of  $202^\circ$ . Find its coordinates to the nearest 0.01.

$$x = 14 \cos 202^\circ \approx -12.98$$

$$y = 14 \sin 202^\circ \approx -5.24$$

$$\boxed{(-12.98, -5.24)}$$



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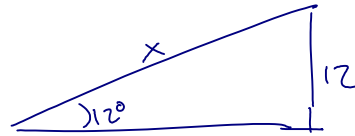
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For each problem, draw a LABELED diagram (with #s and variables) and answer the stated question to the nearest 0.01.

1. A ramp for putting baggage into airplanes needs to rise 12 feet at an angle of no more than  $12^\circ$ . How long must the ramp be?

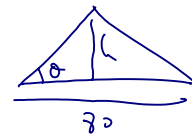
$$\sin 12^\circ = \frac{12 \text{ ft}}{x} \Rightarrow x = \frac{12 \text{ ft}}{\sin 12^\circ}$$

$$x \approx 57.72 \text{ ft}$$



2. An isosceles triangle has a base of length 80 and an area of 360. What is the measure of one of its base angles?

$$\frac{1}{2} \cdot 80 \cdot h = 360 \Rightarrow h = 9 \quad ; \quad \theta = \tan^{-1}\left(\frac{9}{40}\right) \approx 12.68^\circ$$

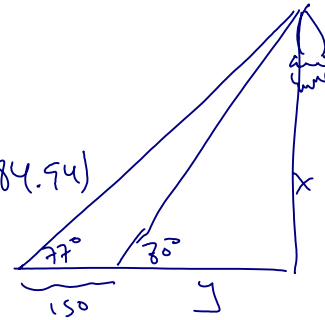


3. Jenna and Jeff stand 150 feet apart to observe a test shot of Mr. Kinderman's newest  $H_2$ -powered rocket; Jeff is between Jenna and the rocket (so gallant!). The rocket rises to an angle of elevation of  $80^\circ$  from Jeff and  $77^\circ$  from Jenna. How high up did it fly?

$$\begin{cases} \tan 80^\circ = \frac{x}{j} \\ \tan 77^\circ = \frac{x}{j+150} \end{cases}$$

$$\Rightarrow (x, j) \approx (2750.21, 484.94)$$

$$2750.21 \text{ ft}$$



4. A point is 14 units away from the origin at an angle of  $202^\circ$ . Find its coordinates to the nearest 0.01.

$$x = 14 \cos 202^\circ \approx -12.98$$

$$y = 14 \sin 202^\circ \approx -5.24$$

$$(-12.98, -5.24)$$

