

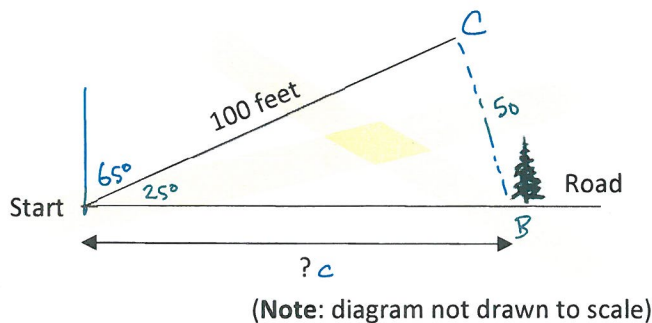
Alg2/Trig 2017-18  
Chapter 9 Test – Trig Unit

Name KEY Period \_\_\_\_\_

- Calculators are allowed. Round all answers to hundredth.
- Show your work neatly for full credit.

1. Tracy is on a straight road. She decides to start walking on a path N65°E from the road for a distance of 100 feet. She sees a tree that is 50 feet away from her on the road.

How far might the tree be from her starting point?



Answer(s): 63.91 or 117.35

$$\frac{\sin B}{100} = \frac{\sin 25}{50}$$

$$B = \sin^{-1}\left(\frac{100}{50} \cdot \sin 25\right)$$

$$= \sin^{-1}(2 \cdot \sin 25)$$

$$= 57.70^\circ$$

$$B' = 180 - B$$

$$= 122.30^\circ$$

$$C = 180 - A - B$$

$$= 97.3^\circ$$

$$C = 180 - 25 - 122.3$$

$$= 32.70^\circ$$

$$\frac{c}{\sin 97.3} = \frac{50}{\sin 25}$$

$$c = \frac{\sin 97.3}{\sin 25} \cdot 50$$

$$= \boxed{117.35}$$

$$c = \frac{\sin 32.70^\circ}{\sin 25^\circ} \cdot 50$$

$$= \boxed{63.91}$$

2. Solve for x for x in  $[0, 2\pi)$ . Show all algebraic steps.

$$\sin 2x - \frac{1}{2} \sin x = 0$$

$$x = \underline{0, \pi, 1.32, 4.97}$$

$$2 \sin x \cos x - \frac{1}{2} \sin x = 0$$

$$\sin x (2 \cos x - \frac{1}{2}) = 0$$

$$\sin x = 0 \quad \cos x = \frac{1}{4}$$

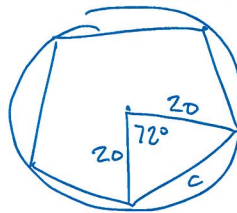
$$x = 0, \pi \quad x = \cos^{-1}\left(\frac{1}{4}\right)$$

$$= \boxed{1.32}$$

$$x = 2\pi - 1.32$$

$$= \boxed{4.97}$$

3. What is the perimeter of a regular pentagon (5 equilateral sides) that has been inscribed inside of a circle of radius 20 cm?



$$\text{Perimeter} = \underline{117.56 \text{ cm}}$$

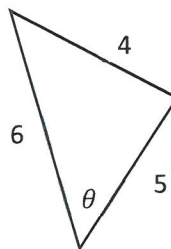
$$c = \sqrt{20^2 + 20^2 - 2(20)^2 \cos 72^\circ}$$

$$= 23.51$$

$$5 \cdot c = 117.56$$

$$\frac{360}{5} = 72$$

4. Find the angle  $\theta$  in the triangle below (diagram not drawn to scale).



$$\theta = \underline{41.41^\circ}$$

$$4^2 = 5^2 + 6^2 - 2(5)(6) \cos \theta$$

$$\theta = \cos^{-1}\left(\frac{5^2 + 6^2 - 4^2}{2(5)(6)}\right)$$

$$= 41.41^\circ$$