

Pre-Calculus: CH#6 Review

Numeric Response

1. Find the radian measures of the angles with the given degree measures.

(a) 72° _____ rad

$$72 \times \frac{\pi}{180} = \frac{72\pi}{180} \div 9 = \frac{8\pi}{20} \div 4 = \boxed{\frac{2\pi}{5}}$$

2. Find the degree measure of the angle with the given radian measure.

(a) $\frac{11\pi}{6}$ _____ $^\circ$

$$\frac{11\pi}{6} \times \frac{180}{\pi} = 11 \cdot 30 = \boxed{330^\circ}$$

3. Find an angle between 0° and 360° that is coterminal with the given angle.

770° _____ $^\circ$

$$770 - 360 = 410 - 360 = \boxed{50^\circ}$$

4. Find an angle between 0 and 2π that is coterminal with the given angle.

$\frac{19\pi}{4}$ _____

$$\frac{19\pi}{4} = 4\frac{3\pi}{4} - 2\pi = 2\frac{3\pi}{4} - 2\pi = \boxed{\frac{3\pi}{4}}$$

5. Find the length of an arc that subtends a central angle of 60° in a circle of radius 25 m.

_____ m

$$s = r\theta = \frac{\pi}{3} \cdot 25 = \boxed{\frac{25\pi}{3}}$$

change $60^\circ \rightarrow R$
 $\frac{60 \times \pi}{180} = \frac{\pi}{3}$

6. A sector of a circle of radius 10 mi has a central angle of 150° . Find the area of the sector.

_____ $^\circ$

$$A = \frac{1}{2} r^2 \theta$$

$$= \frac{1}{2} (10)^2 \left(\frac{5\pi}{6} \right)$$

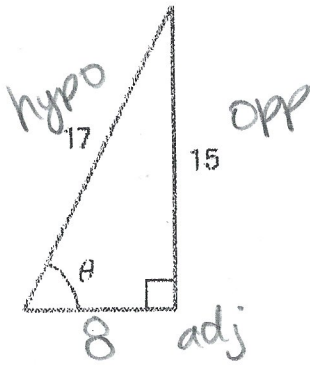
$$= \frac{1}{2} (100) \left(\frac{5\pi}{6} \right)$$

$$= 50 \cdot \frac{5\pi}{6}$$

$$= \frac{250\pi}{6} \div 2 = \boxed{\frac{125\pi}{3}}$$

change $150^\circ \rightarrow R$
 $\frac{150 \cdot \pi}{180} = \frac{5\pi}{6}$

7. Find the exact values of the six trigonometric ratios of the angle θ in the triangle. Enter your answer as a fraction.



$$a^2 + b^2 = c^2$$

$$a^2 + 15^2 = 17^2$$

$$a^2 + 225 = 289$$

$$-225 \quad -225$$

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

$$a = 8$$

SOH CAH TOA

(a) Find $\sin \theta = \frac{15}{17}$

(d) Find $\csc \theta = \frac{17}{15}$

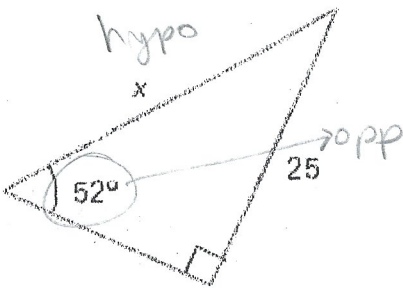
(b) Find $\cos \theta = \frac{8}{17}$

(e) Find $\sec \theta = \frac{17}{8}$

(c) Find $\tan \theta = \frac{15}{8}$

(f) Find $\cot \theta = \frac{8}{15}$

8. Find the side labeled x . State your answer correct to two decimal places.



SOH CAH TOA

$$\frac{\sin 52^\circ}{1} = \frac{25}{x}$$

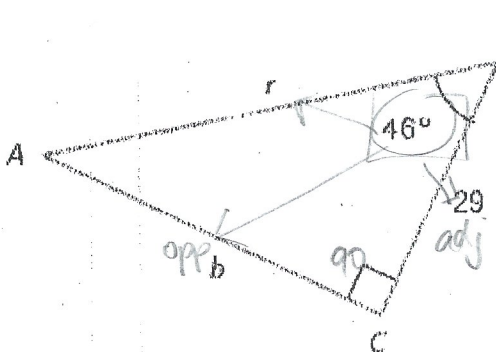
$$x \cdot \frac{\sin 52^\circ}{\sin 52^\circ} = \frac{25}{\sin 52^\circ}$$

$$x = \frac{25}{0.7880}$$

$$x = 31.73$$

$x =$ _____

9. Solve the right triangle.



angle A

$$90 + 46 = 136$$

$$180 - 136 = 44$$

$$\frac{\cos 46^\circ}{1} = \frac{29}{r}$$

$$\frac{\tan 46^\circ}{1} = \frac{b}{29}$$

$$b = 29 \cdot \tan 46^\circ$$

$$b = 29 \cdot (1.0355)$$

$$b = 30.03$$

(a) Find b . Please give the answer to two decimal places.

(b) Find r . Please give the answer to two decimal places.

(c) Find $\angle A = 44^\circ$

$$r \cdot \frac{\cos 46^\circ}{\cos 46^\circ} = \frac{29}{\cos 46^\circ}$$

$$r = \frac{29}{0.6947}$$

$$r = 41.75$$

10. Find the exact value for each trigonometric function.

(a) $\cos(-30^\circ) = \frac{300}{300} = \frac{30}{300}$

$\cos 330$ Change $330 \rightarrow R$

$330 \times \frac{\pi}{180} = 3 \frac{11\pi}{6} \left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

$\cos = x$

$\frac{\sqrt{3}}{2}$

11. Find the exact value for each trigonometric function.

(a) $\sec 120^\circ = \frac{1}{x}$

$120 \times \frac{\pi}{180} = \frac{2\pi}{3} \left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

$\Rightarrow \frac{1}{-\frac{1}{2}} = 1 \cdot \frac{-2}{1} = -2$

(b) $\tan 390^\circ = \frac{y}{x}$

$390 - 300 = 30 \rightarrow \frac{\pi}{6} \left(\frac{\sqrt{3}}{2}, \frac{1}{2}\right)$

$\frac{y}{x} = \frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}} = \frac{1}{\sqrt{3}} = \frac{1\sqrt{3}}{\sqrt{3}\sqrt{3}} = \frac{\sqrt{3}}{3}$

12. Find the exact value for each trigonometric function.

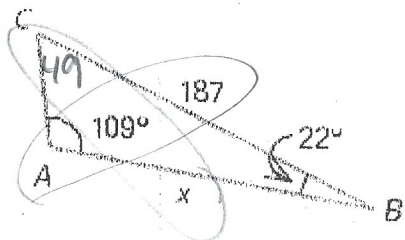
(a) $\sin \frac{2\pi}{3}$

$\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$

$\sin = y$

$\frac{\sqrt{3}}{2}$

13. Use the Law of Sines to find the indicated side x . Please round the answer to the nearest tenth.



$\frac{109}{131} = \frac{180}{49}$

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

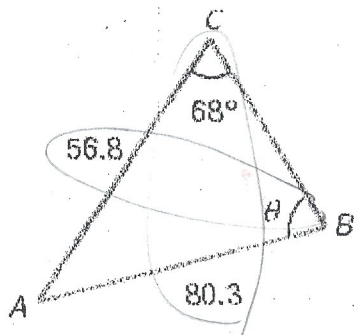
$\frac{\sin 109^\circ}{187} = \frac{\sin 49^\circ}{x}$

$x \cdot \sin 109^\circ = 187 \cdot \sin 49^\circ$

$x = \frac{187(0.7547)}{0.9455} = 149.3$

$x \approx$ _____

14. Use the Law of Sines to find the indicated angle θ . Please round the answer to the nearest tenth.



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

$\frac{\sin \theta}{56.8} = \frac{\sin 68^\circ}{80.3}$

$80.3 / \sin \theta = 56.8 \cdot \sin 68^\circ / 80.3$

$\sin \theta = 56.8(0.9272)$

$\sin^{-1} \sin \theta = \sin^{-1} 0.6558$

$\theta = 41.0$

15. Sketch the triangle and then solve the triangle using the Law of Sines. Please round the answer to the nearest tenth.

$$\angle A = 23^\circ, \angle B = 100^\circ, c = 50$$

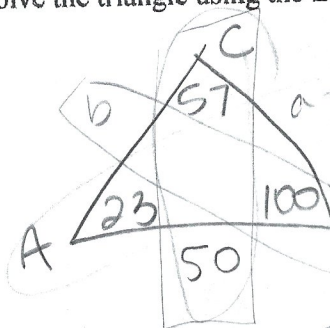
$$\angle C = \underline{57^\circ}$$

$$a = \underline{23.3}$$

$$b = \underline{58.7}$$

$$\text{angle } C \Rightarrow 23 + 100 = 123$$

$$180 - 123 = \boxed{57}$$



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

$$\frac{\sin 23}{23.3} = \frac{\sin 57}{50}$$

$$a \cdot \frac{\sin 57}{\sin 23} = \frac{50 \cdot \sin 23}{\sin 57}$$

$$a = \frac{50 \cdot (.3907)}{.8386}$$

$$\boxed{a = 23.3}$$

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

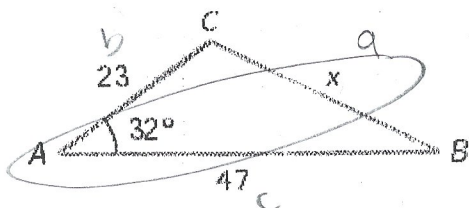
$$\frac{\sin 100}{58.7} = \frac{\sin 57}{50}$$

$$b \cdot \frac{\sin 57}{\sin 100} = \frac{50 \cdot \sin 100}{\sin 57}$$

$$b = \frac{50 \cdot (.9848)}{.8386}$$

$$\boxed{b = 58.7}$$

16. Use the Law of Cosines to determine the indicated side x. Please round the answer to the nearest tenth.



$$x = \underline{30.1}$$

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

$$x^2 = 23^2 + 47^2 - 2(23)(47) \cos 32^\circ$$

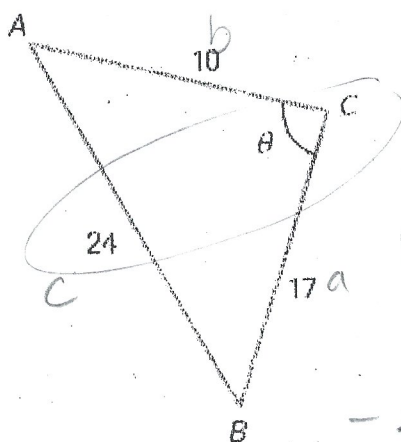
$$x^2 = 529 + 2209 - 2102(.8480)$$

$$x^2 = 2738 - 1833.4$$

$$\sqrt{x^2} = \sqrt{904.6}$$

$$\boxed{x = 30.1}$$

17. Use the Law of Cosines to determine the indicated angle θ . Please round the answer to the nearest hundredth.



$$\theta = \underline{123.37^\circ}$$

$$c^2 = a^2 + b^2 - 2ab \cos C$$

$$24^2 = 17^2 + 10^2 - 2(17)(10) \cos C$$

$$576 = 289 + 100 - 340 \cos C$$

$$576 = 389 - 340 \cos C$$

$$187 = -340 \cos C$$

$$\frac{-187}{-340} = \frac{-340 \cos C}{-340}$$

$$-0.55 = \cos C$$

$$\boxed{C = 123.37}$$