Advanced Math
Chapter 5 Practice Test

Name **Key**
Date _____ Hour _____

Show your work.

1. Change 128.433° to degrees, minutes, and seconds

$$128 + .433(60)$$

$$25.98$$

$$25 + .98(60)$$

$$\boxed{128° \quad 25' \quad 58.8''}$$

2. Write 21°44'3" as a decimal to the nearest thousandth of a degree.

$$21 + \frac{44}{60} + \frac{3}{3600}$$

$$21 + 0.733 + .001 \quad = \quad \boxed{21.734°}$$

3. Give the angle measure represented by 0.5 rotations clockwise.
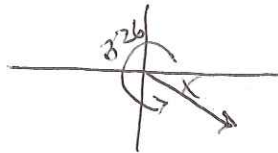
$$0.5(-360) = \boxed{-180°}$$

4. Identify the coterminal angle between 0° and 360° for the angle 480°.

$$480 - 360 = \boxed{120°}$$

5. Find the measure of the reference angle for 1046°

$$1046 - 360 - 360 = 326$$

$$x = 360 - 326 = \boxed{34°}$$

6. If cos $\theta = 0.5$, find secθ.

They are reciprocals!

$$\boxed{\sec\theta = 2}$$

7. Find cot (-180°).

use cot (180) = $\frac{-1}{0}$ $\boxed{\text{undef}}$

8. Find the exact value of cos 135°.

(use unit circle)

$$\boxed{-\frac{\sqrt{2}}{2}}$$

9. If 0° ≤ x ≤ 360°, solve the equation tan x = -1.

we want $\frac{y}{x} = -1$ on unit circle.

$$\boxed{135° \quad \text{or} \quad 315°}$$

10. Assuming an angle in quadrant I, evaluate $\cos(\tan^{-1}\frac{4}{3})$. $= \boxed{^3/_5}$

$c^2 = 4^2 + 3^2$
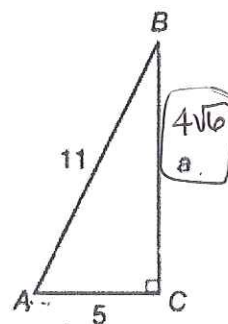
$c = 5$

5   4

θ

3

For 11-13, refer to the figure at the right. Leave as exact answers.

11. Find the value of the sine for $\angle A$.

$\boxed{\dfrac{4\sqrt{6}}{11}}$

B

$4\sqrt{6}$ $11^2 - 5^2 = a^2$

11   a $96 = a^2$

$\sqrt{96} = \sqrt{16 \cdot 6}$

A $\underset{5}{\quad}$ C $= 4\sqrt{6}$

12. Find the value of the cotangent for $\angle A$.

$\dfrac{5}{4\sqrt{6}} \cdot \dfrac{\sqrt{6}}{\sqrt{6}} = \boxed{\dfrac{5\sqrt{6}}{24}}$

13. Find the value of the secant for $\angle A$.

$^h/_a$

$\boxed{^{11}/_5}$

14. Find the **exact value** of $\sec\theta$ for angle θ in standard position if the point at (-3, 2) lies on its terminal side.
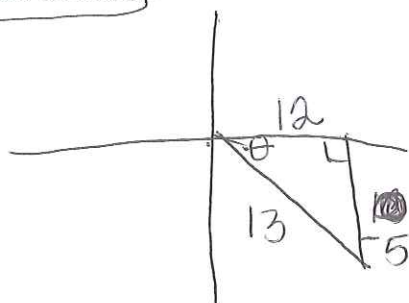
$2^2 + (-3)^2 = c^2$

$4 + 9 = c^2$

$\sqrt{13} = c$

$\sec\theta \quad ^h/_a$

2   $\sqrt{13}$

-3

$= \boxed{^{\sqrt{13}}/_{-3}}$

15. Suppose θ is an angle in standard position whose terminal side lies in Quadrant IV. If $\cos\theta = \dfrac{12}{13}$, find the **exact value** of $\csc\theta$.

$13^2 - 12^2 = b^2$

$25 = b^2$

$5 = b$

12

13   -5

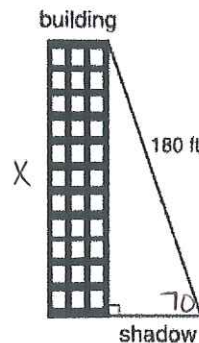$\boxed{\csc\theta = -\dfrac{13}{5}}$

watch negative in QIV

For 16 and 17 refer to the figure. The angle of elevation from the end of the shadow to the top of the building is 70° and the distance is 180 feet.

16. Find the height of the building to the nearest foot.

$$\sin 70 = \frac{X}{180}$$

$$X = 180 \sin 70 = 169.1$$

$$\boxed{169 \text{ ft}}$$

building

180 ft

X

70

shadow

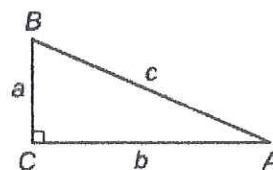17. Find the length of the shadow to the nearest foot.

$$\cos 70 = \frac{X}{180}$$

$$\boxed{X = 62 \text{ ft}}$$

18. Given the triangle at the right, find B to the nearest tenth of a degree if $b = 10$ and $c = 14$.

$$\sin B = \frac{10}{14}$$

$$\boxed{B = 45.6°}$$

B

c

a

C   b   A

19. Determine the number of possible solutions if $A = 48°$, $a = 5$, and $b = 6$.

$$A < 90°$$

$$a < b$$

$$b \sin A$$

$$6 \sin 48$$

$$4.5$$

$$a > b \sin A$$

$$\boxed{2 \text{ triangles}}$$

20. In $\triangle ABC$, $a = 2.4$, $b = 8.2$, and $c = 10.1$. Find B to the nearest tenth of a degree.

$$b^2 = a^2 + c^2 - 2ac \cos B$$

$$8.2^2 = 2.4^2 + 10.1^2 - 2(2.4)(10.1) \cos B$$

$$\boxed{B \approx 33.3°}$$

21. If $a = 12$, $b = 30$, and $c = 22$, find the area of $\triangle ABC$.

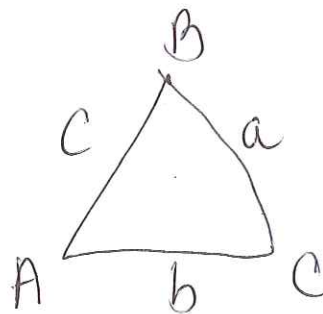$$12^2 = 30^2 + 22^2 - 2(30)(22) \cos A$$

$$A \approx 20.0°$$

$$\text{Area} = \frac{1}{2}(30)(22) \sin 20 = \boxed{113.1 \text{ un}^2}$$

22. In $\triangle ABC$, $A = 47°15'$, $B = 58°33'$, and $c = 23$. Find b.

$$C = 74.2°$$

$$\frac{\sin 74.2}{23} = \frac{\sin 58.55}{b}$$

$$\boxed{b = 20.4}$$

23. In $\triangle ABC$, $A = 32.2°$, $b = 21.5$, and $c = 11.3$. Find the area of ABC.
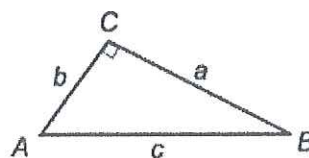
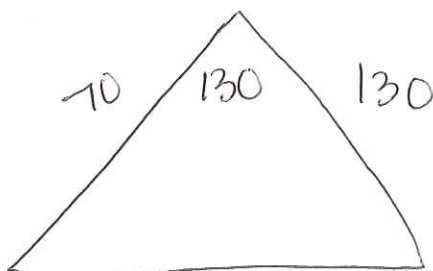$$\tfrac{1}{2}(21.5)(11.3)\sin 32.2$$

$$\boxed{64.7 \ un^2}$$

24. Given the triangle at the right, find a if $A = 37°$ and $b = 6$.

$$\tan 37 = a/6$$

$$\boxed{a = 4.5}$$

25. A ship at sea is 70 miles from one radio transmitter and 130 miles from another. The measurement of the angle between signals is 130°. How far apart are the transmitters?

$$x^2 = 70^2 + 130^2 - 2(70)(130)\cos 130$$

$$\boxed{X = 183.0 \ mi}$$