Algebra 2
Chapter 12 Exam Review

Name: Key

For each of the following equations, find the solutions that lie in the domain $0 \le x < 2\pi$.

1) $2\sin\theta = \sqrt{2}$

$\sin\theta = \frac{\sqrt{2}}{2}$

$\boxed{\frac{\pi}{4}, \frac{3\pi}{4}}$

2) $2\cos\theta = -\sqrt{3}$

$\cos\theta = -\frac{\sqrt{3}}{2}$ $\quad \frac{\pi}{6}$ $\quad$ In Quad: II, III

$\boxed{\frac{5\pi}{6}, \frac{7\pi}{6}}$

3) $4\sin\theta + 2 = 0$

$4\sin\theta = -2$

$\sin\theta = -\frac{1}{2}$ $\quad \frac{\pi}{6}$ $\quad$ In Quad: III, IV

$\boxed{\frac{7\pi}{6}, \frac{11\pi}{6}}$

4) $4\cos^2\theta - 4 = 0$

$4\cos^2\theta = 4$

$\cos^2\theta = 1$

$\cos\theta = \pm 1$

$\boxed{0, \pi}$

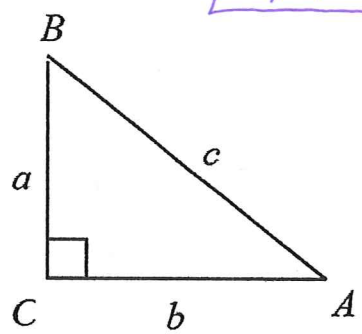
5) Using the triangle below, find:

a. $\sin A$ $\boxed{\frac{a}{c}}$

b. $\sec A$ $\boxed{\frac{c}{b}}$

c. $\csc B$ $\boxed{\frac{c}{b}}$

d. $\tan B$ $\boxed{\frac{b}{a}}$



For each of the following equations, find the solutions that lie in the domain $0 \le x < 2\pi$.

6) $\sec^2\theta + 3 = 4$

$\sec^2\theta = 1$

$\sec\theta = \pm 1$

$\cos = \pm 1$

$\boxed{0, \pi}$

7) $\cot\theta = \sqrt{3}$

$\tan\theta = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}}$

$\tan\theta = \frac{\sqrt{3}}{3}$

$\boxed{\frac{\pi}{6}, \frac{7\pi}{6}}$

8) Rewrite each of the following expressions in terms of either $\sin(\vartheta)$ or $\cos(\vartheta)$.

a) $\tan(\vartheta)$ $\boxed{\frac{\sin\theta}{\cos\theta}}$

b) $\csc(\vartheta)$ $\boxed{\frac{1}{\sin\theta}}$

c) $\cot(\vartheta)$ $\boxed{\frac{\cos\theta}{\sin\theta}}$

d) $\sec(\vartheta)$ $\boxed{\frac{1}{\cos\theta}}$

Verify each identity.

9) $\tan\theta \sin\theta \cos\theta \csc^2\theta = 1$

$\frac{\sin\theta}{\cos\theta} \cdot \frac{\sin\theta}{1} \cdot \frac{\cos\theta}{1} \cdot \frac{1}{\sin^2\theta}$

$\boxed{1}$

10) $\sin^2\theta + \sin^2\theta \tan^2\theta = \tan^2\theta$

$\sin^2\theta(1+\tan^2\theta)$

$\sin^2\theta(\sec^2\theta)$

$\sin^2\theta\left(\frac{1}{\cos^2\theta}\right)$

$\frac{\sin^2\theta}{\cos^2\theta}$

$\boxed{\tan^2\theta}$

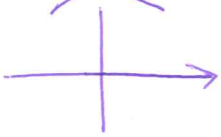
11) $\frac{1+\tan^2\theta}{1+\cot^2\theta} = \tan^2\theta$

$\frac{\sec^2\theta}{\csc^2\theta}$

$\frac{\frac{1}{\cos^2\theta}}{\frac{1}{\sin^2\theta}} = \frac{1}{\cos^2\theta} \cdot \frac{\sin^2\theta}{1} = \frac{\sin^2\theta}{\cos^2\theta} = \boxed{\tan^2\theta}$

Find the exact value.

12) $\cos 195°$



Sorry!

We didn't learn this!

13) $\sin\frac{25\pi}{12}$

ANSWERS

1) $\theta = \frac{\pi}{4}, \frac{3\pi}{4}$

2) $\theta = \frac{5\pi}{6}, \frac{7\pi}{6}$

3) $\theta = \frac{7\pi}{6}, \frac{11\pi}{6}$

4) $\theta = 0, \pi$

5a) $\frac{a}{c}$ 5b) $\frac{c}{b}$ 5c) $\frac{c}{b}$ 5d) $\frac{b}{a}$

6) $\theta = 0, \pi$

7) $\theta = \frac{\pi}{6}, \frac{7\pi}{6}$

8a) $\frac{\sin\theta}{\cos\theta}$ 8b) $\frac{1}{\sin\theta}$ 8c) $\frac{\cos\theta}{\sin\theta}$ 8d) $\frac{1}{\cos\theta}$

9-11) Proofs ☺

12) $\frac{-\sqrt{2}-\sqrt{6}}{4}$

13) $\frac{-\sqrt{2}+\sqrt{6}}{4}$