Math 140 Practice Exam 4

Write angles in exact radians, no decimals, no degrees.

1(10). For the graph below, find the amplitude, find the period, and find an equation of the form $y = \pm A\sin(Bx)$ or $y = \pm A\cos(Bx)$.

![Graph](image)

2(14). Graph $y = -2\sin(\pi x - \pi)$.

3(9). Graph $y = \tan(-x/2 + \pi)$ over one period. List the $x$-intercepts and the vertical asymptotes which occur in this period.

4(9). Graph $y = \sec(x + \pi)$. Draw the asymptotes as dotted lines. Be prepared to graph cot and csc.

5(6). Simplify $\sin(x + y)\cos x - \cos(x + y)\sin x$.

6(6). Simplify $\frac{\tan(\pi/5) - \tan(\pi/30)}{1 + \tan(\pi/5)\tan(\pi/30)}$.

7(12). $x = (\sin \theta)/2$, $\frac{\pi}{2} < \theta < \pi$.

(a) Find $\sin 2\theta$

(b) Find $\sin(\theta/2)$

(c) Find $\tan(\theta/2)$

8(5). Write as a sum or difference of trig functions.

$\cos(x - 1)\sin(x + 1)$

9(5). Find all solutions to $\cos \theta + \frac{\sqrt{3}}{2} = 0$.

Two sets of solutions.

10(10). Find all solutions of $2\sin^2 x + 5\cos x = 4$.

Two sets of solutions.

11(14). Find the exact value (no decimals) of

(a) $\cos^{-1}(-\sqrt{3}/2)$

(b) $\tan^{-1}(-\sqrt{3})$

(c) $\sin^{-1}(\sin(\frac{5\pi}{7}))$

(d) $\tan(\arcsin(\frac{1}{2}))$

Answers

1. amplitude = 2, period = 6, $y = -2\cos \frac{x}{3}$

2. 

3. $x$-inter: $2\pi$, vert. asymp: $x = \pi$, $x = 3\pi$.

4. 

5. $\sin y$

6. $1/\sqrt{3}$

7. (a) $-4x\sqrt{1 - 4x^2}$

(b) $\sqrt{\frac{1 + \sqrt{1 - 4x^2}}{2}}$

(c) $\frac{2x}{1 - \sqrt{1 - 4x^2}}$

8. $\frac{1}{2}[\sin(2) + \sin(2x)]$

9. $\theta = -5\pi/6 + 2\pi n$, $5\pi/6 + 2\pi n$

10. $x = \frac{\pi}{3} + 2\pi n$, $x = -\frac{\pi}{3} + 2\pi n$

11. (a) $5\pi/6$ (b) $-\pi/3$ (c) $2\pi/7$ (d) $\pi/4$