Solutions to ch 9, 10, and 11 practice problems

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1. Look these up in the book if you do not know them by heart.

2.

θ	sine	cosine	tangent	secant	cosecant	cotangent
$330°$	$\frac{-1}{2}$	$\frac{\sqrt{3}}{2}$	$-\frac{1}{\sqrt{3}}$	$\frac{2}{\sqrt{3}}$	-2	$-\sqrt{3}$
$390°$	$\frac{1}{2}$	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{3}}$	$\frac{2}{\sqrt{3}}$	2	$\sqrt{3}$
$480°$	$\frac{\sqrt{3}}{2}$	$\frac{-1}{2}$	$-\sqrt{3}$	-2	$\frac{2}{\sqrt{3}}$	$-\frac{1}{\sqrt{3}}$
$\frac{9\pi}{2}$	1	0	undef.	undef.	1	0
-3π	0	-1	0	-1	undef.	undef.
$\frac{-16\pi}{3}$	$\frac{\sqrt{3}}{2}$	$\frac{-1}{2}$	$-\sqrt{3}$	-2	$\frac{2}{\sqrt{3}}$	$-\frac{1}{\sqrt{3}}$

3. arc length $= s = 3\pi$.

4. $A = \frac{21\pi}{2}$.

5. Range of f: $[-1, 1]$. Range of g: $[-1, 1]$, Range of h: the set of all real numbers.

6. $t = \pm\frac{3}{5}$.

7. $\frac{2\pi}{3}, \frac{4\pi}{3}, \frac{8\pi}{3}, \frac{10\pi}{3}$.

8. $\sin(\theta) = \frac{-3}{\sqrt{10}}$, $\cos(\theta) = \frac{-1}{\sqrt{10}}$.

9. $\cos(\theta) = -\frac{\sqrt{8}}{9}$

10. $15\cos(71°)$.

11. $\frac{-3\sqrt{2}}{2\cos(51°)-\sqrt{2}}$ *NOTE:* I simplified this quite a bit, so your answer may look very different. To check if you got the right answer, type your answer into a calculator and see if its the same as mine.

12. General hints: use $\tan(\theta) = \frac{\sin(\theta)}{\cos(\theta)}$, $\sin^2(\theta) + \cos^2(\theta) = 1$. (Also, use $1 + tan^2(\theta) = \sec^2(\theta)$ and $\sec(\theta) = \frac{1}{\cos(\theta)}$.

13. On the left hand side. Find a common denominator and add fractions.

14. use $\sec(\theta) = \frac{1}{\cos(\theta)}$, $\csc(\theta) = \frac{1}{\sin(\theta)}$ and the previous problem.

15. Domains of f and g are both $[-1, 1]$, domain of h is the set of all real numbers. The range of f is $[0, \pi]$. The range of g is $[-\frac{\pi}{2}, \frac{\pi}{2}]$. The range of h is $(-\frac{\pi}{2}, \frac{\pi}{2})$.

16. $\frac{-1}{2}, \frac{1}{2}, \frac{\sqrt{3}}{2}$

17. $\frac{-\pi}{6}, \frac{5\pi}{6}$

18. $\frac{t}{\sqrt{1-t^2}}$.

19. $\sqrt{1+t^2}$

20. period is 2, amplitude is 10. Range is $[-11, 9]$. Use Wolfram alpha to check your graph (Google wolfram alpha, or find the link to it on the course website under resources).

21. amplitude, period and range is the same as above. Use Wolfram alpha to check your graph.