Homework Math 140
Lectures 3 and 4
Will be quizzed Thursday Feb 14

Problem 1 *(Textbook page A32, problems 1-6). Convert from degrees to radians.*

1. $210°$.
2. $300°$.
3. $9°$.
4. $-315°$.
5. $900°$.
6. $36°$.

Problem 2 *(Textbook page A32, problems 7-12). Convert from radians to degrees.*

1. 4π.
2. $-7/2\pi$.
3. $5/12\pi$.
4. $8/3\pi$.
5. $-3/8\pi$.
6. 5.

Problem 3 *(Textbook page A32-, problems 45, 46, 47, 48, 49, 50, 51, 52, 56, 57, 58).*

1. $\sin\theta\cot\theta = \cos\theta$.
2. $(\sin x + \cos x)^2 = 1 + \sin(2x)$.
3. $\sec y - \cos y = \tan y \sin y$.
4. $\tan^2\alpha - \sin^2\alpha = \tan^2\alpha\sin^2\alpha$.
5. $\cot^2\theta + \sec^2\theta = \tan^2\theta + \csc^2\theta$.
6. $2\csc 2t = \sec t \csc t$.
7. $\tan 2\theta = \frac{2\tan\theta}{1-\tan^2\theta}$.
8. $\frac{1}{1-\sin\theta} + \frac{1}{1+\sin\theta} = 2\sec^2\theta$.
9. $\tan x + \tan y = \frac{\sin(x+y)}{\cos x\cos y}$.
10. $\sin 3\theta + \sin\theta = 2\sin 2\theta\cos\theta$.
11. $\cos 3\theta = 4\cos^3\theta - 3\cos\theta$.

Problem 4 *(Textbook page A33, problems 65-72). Find all values of x in the interval $[0, 2\pi]$ that satisfy the equation.*

1. $2\cos x - 1 = 0$.
2. $3\cot^2 x = 1$.
3. $2\sin^2 x = 1$.
4. $|\tan x| = 1$.
5. $\sin 2x = \cos x$.
6. $2\cos x + \sin 2x = 0$.
7. $\sin x = \tan x$.
8. $2 + \cos 2x = 3\cos x$.

Problem 5 *(Textbook page 69, problems 3-9). Evaluate the limits. Justify your computations.*

1. $\lim_{x\to 3} 5x^3 - 3x^2 + x - 6$.
2. $\lim_{x\to -1}(x^4 - 3x)(x^2 + 5x + 3)$.
3. $\lim_{t\to -2}\dfrac{t^4 - 2}{2t^2 - 3t + 2}$.
4. $\lim_{u\to -2}\sqrt{u^4 + 3u + 6}$.
5. $\lim_{x\to 8}(1 + \sqrt[3]{x})(2 - 6x^2 + x^3)$.
6. $\lim_{t\to 2}\left(\dfrac{t^2 - 2}{t^3 - 3t + 5}\right)^2$.

7. $\lim_{x\to 2}\sqrt{\dfrac{2x^2+1}{3x-2}}$.

Problem 6 *(Textbook page 70, problems 11-32). Evaluate the limit if it exists.*

1. $\lim_{x\to 5}\dfrac{x^2-6x+5}{x-5}$.
2. $\lim_{x\to 4}\dfrac{x^2-4x}{x^2-3x-4}$.
3. $\lim_{x\to 5}\dfrac{x^2-5x+6}{x-5}$.
4. $\lim_{x\to -1}\dfrac{x^2-4x}{x^2-3x-4}$.
5. $\lim_{t\to -3}\dfrac{t^2-9}{2t^2+7t+3}$.
6. $\lim_{x\to -1}\dfrac{2x^2+3x+1}{x^2-2x-3}$.
7. $\lim_{h\to 0}\dfrac{(-5+h)^2-25}{h}$.
8. $\lim_{h\to 0}\dfrac{(2+h)^3-8}{h}$.
9. $\lim_{x\to -2}\dfrac{x+2}{x^3+8}$.
10. $\lim_{t\to 1}\dfrac{t^4-1}{t^3-1}$.
11. $\lim_{h\to 0}\dfrac{\sqrt{9+h}-3}{h}$.
12. $\lim_{u\to 2}\dfrac{\sqrt{4u+1}-3}{u-2}$.
13. $\lim_{x\to -4}\dfrac{\frac{1}{4}+\frac{1}{x}}{4+x}$.
14. $\lim_{x\to -1}\dfrac{x^2+2x+1}{x^4-1}$.
15. $\lim_{t\to 0}\dfrac{\sqrt{1+t}-\sqrt{1-t}}{t}$.
16. $\lim_{t\to 0}\left(\dfrac{1}{t}-\dfrac{1}{t^2+t}\right)$.
17. $\lim_{x\to 16}\dfrac{4-\sqrt{x}}{16x-x^2}$.
18. $\lim_{h\to 0}\dfrac{(3+h)^{-1}-3^{-}1}{h}$.
19. $\lim_{t\to 0}\left(\dfrac{1}{t\sqrt{1+t}}-\dfrac{1}{t}\right)$.
20. $\lim_{x\to -4}\dfrac{\sqrt{x^2+9}-5}{x+4}$.
21. $\lim_{h\to 0}\dfrac{(x+h)^3-x^3}{h}$.
22. $\lim_{h\to 0}\dfrac{\frac{1}{(x+h)^2}-\frac{1}{x^2}}{h}$.