

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

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

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

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

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

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

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

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

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

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

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

$$7. \lim_{x \rightarrow 2} \sqrt{\frac{2x^2 + 1}{3x - 2}}.$$

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

$$1. \lim_{x \rightarrow 5} \frac{x^2 - 6x + 5}{x - 5}.$$

$$2. \lim_{x \rightarrow 4} \frac{x^2 - 4x}{x^2 - 3x - 4}.$$

$$3. \lim_{x \rightarrow 5} \frac{x^2 - 5x + 6}{x - 5}.$$

$$4. \lim_{x \rightarrow -1} \frac{x^2 - 4x}{x^2 - 3x - 4}.$$

$$5. \lim_{t \rightarrow -3} \frac{t^2 - 9}{2t^2 + 7t + 3}.$$

$$6. \lim_{x \rightarrow -1} \frac{2x^2 + 3x + 1}{x^2 - 2x - 3}.$$

$$7. \lim_{h \rightarrow 0} \frac{(-5 + h)^2 - 25}{h}.$$

$$8. \lim_{h \rightarrow 0} \frac{(2 + h)^3 - 8}{h}.$$

$$9. \lim_{x \rightarrow -2} \frac{x + 2}{x^3 + 8}.$$

$$10. \lim_{t \rightarrow 1} \frac{t^4 - 1}{t^3 - 1}.$$

$$11. \lim_{h \rightarrow 0} \frac{\sqrt{9 + h} - 3}{h}.$$

$$12. \lim_{u \rightarrow 2} \frac{\sqrt{4u + 1} - 3}{u - 2}.$$

$$13. \lim_{x \rightarrow -4} \frac{\frac{1}{4} + \frac{1}{x}}{4 + x}.$$

$$14. \lim_{x \rightarrow -1} \frac{x^2 + 2x + 1}{x^4 - 1}.$$

$$15. \lim_{t \rightarrow 0} \frac{\sqrt{1 + t} - \sqrt{1 - t}}{t}.$$

$$16. \lim_{t \rightarrow 0} \left(\frac{1}{t} - \frac{1}{t^2 + t} \right).$$

$$17. \lim_{x \rightarrow 16} \frac{4 - \sqrt{x}}{16x - x^2}.$$

$$18. \lim_{h \rightarrow 0} \frac{(3 + h)^{-1} - 3^{-1}}{h}.$$

$$19. \lim_{t \rightarrow 0} \left(\frac{1}{t\sqrt{1 + t}} - \frac{1}{t} \right).$$

$$20. \lim_{x \rightarrow -4} \frac{\sqrt{x^2 + 9} - 5}{x + 4}.$$

$$21. \lim_{h \rightarrow 0} \frac{(x + h)^3 - x^3}{h}.$$

$$22. \lim_{h \rightarrow 0} \frac{\frac{1}{(x+h)^2} - \frac{1}{x^2}}{h}.$$