

Assignments for the Week of Sept. 26

- Read 6.1-6.3, 6.5
- 45 minutes of Khan Academy
- Textbook assignment **due Friday**, Sept. 21:
 - 6.1 #1-69 odd (proofs)
 - 6.3 #1-24 all; 30-36 all; 49-93 odd
- **memorize your identities!!!**

$$52. \frac{\cos 2x}{\sin^2 x} = \cot^2 x - 1$$

$$\begin{aligned} \text{LHS} &= \frac{\cos 2x}{\sin^2 x} = \frac{\cos^2 x - \sin^2 x}{\sin^2 x} = \\ &= \frac{\cos^2 x}{\sin^2 x} - \frac{\sin^2 x}{\sin^2 x} = \cot^2 x - 1 = \text{RHS} \checkmark \end{aligned}$$

$$\frac{2\cos^2 x - 1}{\sin^2 x} = \frac{2\cos^2 x}{\sin^2 x} - \frac{1}{\sin^2 x} = 2\cot^2 x - \csc^2 x$$

$$\left. \begin{aligned} \frac{\sin^2 x + \cos^2 x}{\sin^2 x} &= 1 \\ 1 + \cot^2 x &= \csc^2 x \end{aligned} \right\}$$

$$\begin{aligned} &= 2\cot^2 x - (1 + \cot^2 x) = \\ &= \cot^2 x - 1 \end{aligned}$$

$$56. \frac{\cos^2 x - \sin^2 x}{2 \sin x \cos x} = \cot 2x$$

$$\text{LHS} = \frac{\cos 2x}{\sin 2x} = \text{RHS} \checkmark$$

$$64. \underbrace{2\cos^4 x - \cos^2 x} - \underbrace{2\sin^2 x \cos^2 x + \sin^2 x} = \cos^2 2x$$

$$\text{LHS} =$$

$$= \cos^2 x (2\cos^2 x - 1) - \sin^2 x (2\cos^2 x - 1) = \underbrace{2a^4 - a^2 - 2b^2 a^2 + b^2}_{a^2(2a^2-1) - b^2(2a^2-1)}$$

$$= (2\cos^2 x - 1)(\cos^2 x - \sin^2 x) =$$

$$= (\cos 2x)(\cos 2x) = \cos^2 2x = \text{RHS}$$