

Name _____

Date _____

Calc I H - Pre-2.4 Algebra Review

Period _____

Simplify each expression.

Consider the following:

- Factor GCF first where possible!!
- Get a common denominator when adding or subtracting fractions
- Clear complex fractions OR Combine fractions using common denominator, then KCF

1. $k(x) = \cos x(\sin x + \cos x) - \sin x(\cos x - \sin x)$

$$k(x) = \cancel{\cos x \sin x} + \cos^2 x - \cancel{\sin x \cos x} + \sin^2 x$$

$$k(x) = \cos^2 x + \sin^2 x$$

$$k(x) = 1$$

2. $f(x) = \cancel{5}(3x-8)^{\cancel{3}} + \cancel{45}x(3x-8)^{\cancel{2}}$ GCF: $5(3x-8)^2$

$$f(x) = 5(3x-8)^2(3x-8 + 9x)$$

$$f(x) = 5(3x-8)^2(12x-8)$$

$$f(x) = 20(3x-8)^2(3x-2)$$

3. $h(x) = \frac{4\sqrt{x}\left(\frac{4\sqrt{x}}{4\sqrt{x}} + \frac{4x-1}{4\sqrt{x}}\right)}{x} = \frac{16x + 4x - 1}{4\sqrt{x}}$

$$= \frac{20x-1}{4\sqrt{x}} \cdot \frac{1}{x}$$

$$= \frac{20x-1}{4x^{3/2}}$$

4. $m(x) = (1-x^2)^{1/2} + x\left(\frac{1}{2}\right)(1-x^2)^{-1/2}(-2x)$

$$= \frac{\sqrt{1-x^2} \cdot \sqrt{1-x^2} - x^2}{\sqrt{1-x^2}}$$

$$= \frac{1-x^2-x^2}{\sqrt{1-x^2}} = \frac{1-2x^2}{\sqrt{1-x^2}}$$

5. $j(x) = 4\left(\frac{1-2x}{1+x}\right)^3 \left(\frac{-2(1+x)-(1-2x)}{(1+x)^2}\right)$

$$= 4 \frac{(1-2x)^3}{(1+x)^3} \cdot \frac{-2-2x-1+2x}{(1+x)^2}$$

$$= 4 \frac{(1-2x)^3}{(1+x)^3} \cdot \frac{-3}{(1+x)^2}$$

$$= \frac{-12(1-2x)^3}{(1+x)^5}$$

6. $g(x) = 3\left(\frac{x+5}{x^2+2}\right)^2 \cdot \frac{x^2+2-2x(x+5)}{(x^2+2)^2}$

$$g(x) = 3 \frac{(x+5)^2}{(x^2+2)^2} \cdot \frac{x^2+2-2x^2-10x}{(x^2+2)^2}$$

$$g(x) = \frac{3(x+5)^2(-x^2-10x+2)}{(x^2+2)^4}$$

$$\text{OR } \frac{-3(x+5)^2(x^2+10x-2)}{(x^2+2)^4}$$