

MATH 250 PREPARATION

Simplify the following expressions and rewrite each expression as a single rational expression with positive exponents.

1. $2x(1-x^2)^{1/2} + x^2(1-x^2)^{-1/2}(-2x)$

2.
$$\frac{6t^5(t^3+5)^{2/5} - t^6(t^3+5)^{-3/5}(3t^2)}{\left[(t^3+5)^{2/5}\right]^2}$$

3.
$$\frac{(4x^2+5)(6x-1) - (3x^2-x+2)(8x)}{(4x^2+5)^2}$$

4.
$$\frac{\cos x(1+\cos x) - \sin x(-\sin x)}{(1+\cos x)^2}$$

$$5. (3x+1)^6 \left(\frac{1}{2\sqrt{2x-5}} \right) + 6(3x+1)^5 (3)\sqrt{2x-5}$$

$$6. (3z-1)^4 \left[3(2z+5)^2 (2) \right] + (2z+5)^3 \left[4(3z-1)^3 (3) \right]$$

Find $f(x)$ and $g(x)$ such that $h(x) = (f \circ g)(x) = f(g(x))$

$$7. h(x) = \sqrt{5x^3 - 2}$$

$$f(x) = \underline{\hspace{2cm}} \quad g(x) = \underline{\hspace{2cm}}$$

$$8. h(x) = \sin^2 x$$

$$f(x) = \underline{\hspace{2cm}} \quad g(x) = \underline{\hspace{2cm}}$$

$$9. h(x) = \frac{1}{6-x^2}$$

$$f(x) = \underline{\hspace{2cm}} \quad g(x) = \underline{\hspace{2cm}}$$

$$10. h(x) = (x^2 - 3x + 4)^{3/2}$$

$$f(x) = \underline{\hspace{2cm}} \quad g(x) = \underline{\hspace{2cm}}$$