

MAT 270 - Derivative Practice I

Find the derivative of each of the following functions and simplify.

1. $f(x) = 4x^3 - 3x^2 + 2x - \pi$

2. $f(x) = \frac{x^2}{3} - \frac{3}{x^2}$

3. $f(x) = -3(2x^2 - 5x + 1)$

4. $f(x) = \sqrt{x} - \frac{1}{\sqrt{x}}$

5. $f(x) = \frac{x+1}{x-2}$

6. $f(x) = \frac{x^2 - 2}{x^2}$

7. $f(x) = \frac{x^2}{x^2 - 2}$

8. $f(x) = \sqrt{x}(x^2 + 1)$

9. $f(x) = \frac{e^x}{e^x - 1}$

10. $f(x) = \frac{2}{\sqrt{x}} + \frac{\sqrt{x}}{2}$

$$11. f(x) = \frac{2x}{x-1}$$

$$12. f(x) = (3x-2)(2x+1)$$

$$13. y = 5x^2 - 5\sqrt{x} - \frac{3}{x}$$

$$14. y = \frac{\sqrt{x}}{\sqrt{x}-1}$$

$$15. y = \frac{e^x}{x}$$

$$16. y = 6x^{\frac{-3}{2}} + 7x^{\frac{1}{5}} + 1$$

$$17. y = \frac{-7}{1-x^3}$$

$$18. y = \frac{4}{3}x^{\left(\frac{3}{4}-\pi\right)}$$

$$19. y = \frac{1}{7x}$$

$$20. y = 2x^{\left(\frac{1}{2}-e\right)}$$

Bonus:

$$y = e^{\ln x^2} - 3x^{-7}$$