

Math 126
Practice Final

1) Find the slope and y-intercept of line represented by the following equation.

$$4x - 3y = 3$$

a) $m = 3, b = -4$

b) $m = -\frac{4}{3}, b = 1$

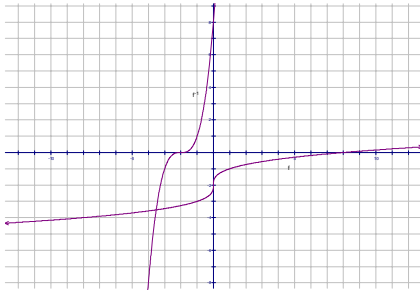
c) $m = \frac{4}{3}, b = -1$

d) $m = \frac{3}{4}, b = -4$

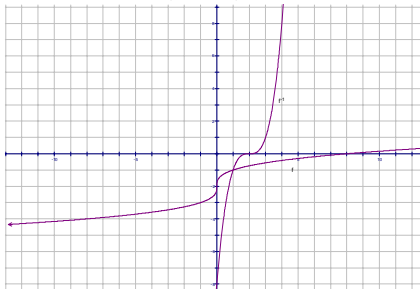
2) Find the inverse of the following function, and then graph $f(x)$ and $f^{-1}(x)$

$$f(x) = \sqrt[3]{x} - 2$$

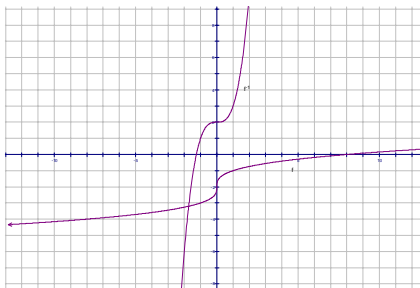
a) $f^{-1}(x) = (x + 2)^3$



b) $f^{-1}(x) = (x + 2)^3$



c) $f^{-1}(x) = x^3 + 2$

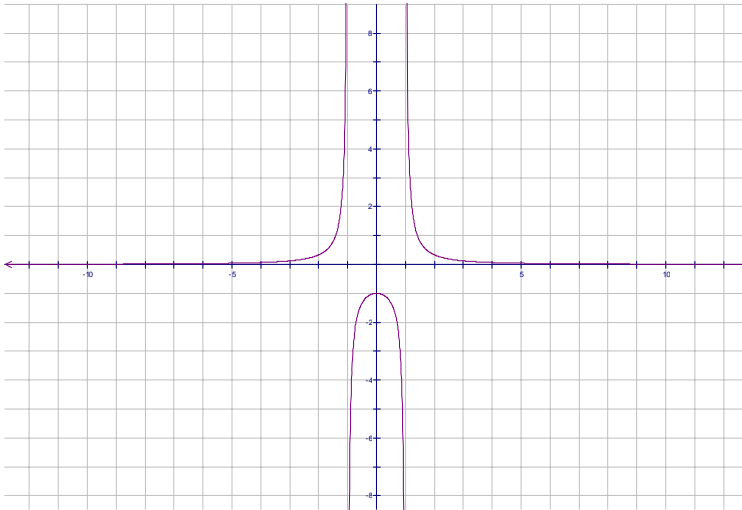


d) None of the above

3) Evaluate $\lim_{x \rightarrow 2} \frac{x^2 - 6x + 8}{x - 2}$

- a) 2
- b) -2
- c) Undefined
- d) -1

4) Which statement about continuity is correct



- a) The function is continuous everywhere.
- b) The function is discontinuous everywhere
- c) The function is continuous everywhere except the values $x = -2$ and $x = 2$
- d) The function is continuous everywhere except the values $x = -1$ and $x = 1$

5) Given $f(x) = 2x^3 + 5x^2 + 3$, find the derivative.

- a) $f'(x) = 4x^3 + 6x$
- b) $f'(x) = 6x^2 + 10x$
- c) $f'(x) = 12x^2 + 10x$
- d) None of the above

6) Find the derivative of $f(x) = (x^2 - 8x)^4$

- a) $f'(x) = 4(2x - 8)^3$
- b) $f'(x) = (x^2 - 8x)^3$
- c) $f'(x) = 4(x^2 - 8x)^3(2x - 8)$
- d) None of the above

7) The Homer Simpson Tire Corporation determined that the daily cost of producing lawn tractor tires can be modeled by the cost function $C(x) = 130 + 60x - 0.02x^2$, where $0 \leq x \leq 360$. Determine the marginal cost for producing 300 tires.

- a) \$4.80
- b) \$48.00
- c) \$480.00
- d) None of the above

8) Determine the intervals where the function is increasing. $f(x) = x^3 - 2$

- a) The function is increasing on $(-\infty, \infty)$
- b) The function is increasing on $(0, \infty)$
- c) The function is increasing on $(-\infty, 0)$
- d) The function is increasing on $(-\infty, 0) \cup (0, \infty)$

9) Find the value of x , the number of units sold, that will produce a maximum profit.

$$P(x) = 2000 + 120x - 0.03x^2$$

- a) 200 units
- b) 2000 units
- c) 4000 units
- d) No solution

10) Find the extrema points of the following function on a domain of all real numbers.

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

- a) Relative maximum at (0,0): Relative minimum at (2,-4)
- b) Relative maximum at (2,-4): Relative minimum at (0,0)
- c) Absolute maximum at (0,0)
- d) Absolute minimum at (2,0)

11) Which statement is true about the concavity of the function $f(x) = x^2 - 3$

- a) The function is concave up on $(-\infty, \infty)$
- b) The function is concave down on $(-\infty, \infty)$
- c) The function is concave up on $(0, \infty)$ and concave down on $(-\infty, 0)$
- d) The function has no concavity.

12) Solve $4^{2x-1} = \frac{1}{64}$

- a) $x = -2$
- b) $x = 1$
- c) $x = -1$
- d) $x = 2$

13) Solve $e^{x+2} = 5$

a) $x = \frac{\ln(5) + 1}{2}$

b) $x = \frac{\ln(5) - 1}{2}$

c) $x = \ln(5) - 2$

d) $x = \ln(5) + 2$

14) Find the derivative of $f(x) = \frac{x^2}{e^{2x}}$

a) $f'(x) = \frac{2x}{2e^{2x}}$

b) $f'(x) = \frac{2xe^x - x^2e^x}{e^{2x}}$

c) $f'(x) = \frac{2x}{e^x}$

d) $f'(x) = \frac{2xe^{2x} - 2x^2e^{2x}}{e^{4x}}$

15) Find the derivative of $f(x) = \ln(x^4)$

a) $f'(x) = 4x^3 \ln(x)$

b) $f'(x) = \frac{4}{x}$

c) $f'(x) = \ln(4x^3)$

d) $f'(x) = 4x$

Other Questions

16) Find the equation of tangent line to the curve $y = (2x - 1)e^x$ at the point (0,-1).

17) Find the derivative of $y = \ln(t^3 e^t)$

18) The demand function for a product is $p = 900 - 4x$ where x is the number of units sold.
How many units must be sold to maximize revenue?

19) Find the absolute extrema for the function $f(x) = x^2 - 4$ on the closed interval $[0,2]$

20) What is the price elasticity of the demand for the demand function $p = 20 - .01x$ at $x = 300$?

21) Find the derivative of $y = 2x^3 e^{5x}$

22) Find the derivative of $y = 4x^2 \ln(3x)$

23) Find the slope of a line that passes between the points (2,3) and (5,0)

24) Find the distance between the points (2,4) and (5,7)

25) Find the inverse of $f(x) = 6x - 2$

- 26) Write $\ln A + \ln B - 2 \ln C$ as a single logarithm.
- 27) Write $5^4 = 625$ as single logarithmic expression.
- 28) Write $\log_6 216 = 3$ as exponential expression.
- 29) Evaluate $\lim_{x \rightarrow 1} 2x^2 + 4x$
- 30) Evaluate $\lim_{x \rightarrow 1} \frac{x^2 - 1}{x - 1}$
- 31) Find the derivative of $y = e^{10x^2}$
- 32) Find the equation of a tangent line to the function $f(x) = x^2 + 1$ at the point $(1, 2)$.
- 33) Find the equation of a tangent line to the function $f(x) = e^x - 2$ at the point $(0, -1)$.