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Math\_Questions\_0029

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- 1) Determine the critical values for the function  $f(x) = x^2 + 10x - 7$ .
- 2) Determine the domain of  $f(x,y) = 3x / (x - 8y)$
- 3) Determine the producers' surplus for the supply function  $s(x) = 0.005x^2 + 6$  at a demand level  $x = 20$ .
- 4) Determine the point elasticity of demand  $E(p)$ , and classify the demand as elastic, inelastic, or unitary.  $d(p) = 1000 - 50p$ ;  $p = 18$
- 5) Determine the derivative of  $f(x) = \ln(2 + x^2)$
- 6) Use the derivative  $f'(x) = 4x - 15$  to determine the  $x$ -values ( $s$ ) where  $f$  has a relative maximum and / or a relative minimum.
- 7) Determine the derivative of  $f(x,y) = 5x^2 - 5y^2 + 2xy + 34x + 38y + 12$
- 8) Determine the derivative of  $f(x) = 5x^2 e^{3x}$
- 9) Determine  $f_{xy}(x,y)$  for  $f(x,y) = 8x^3 y - 7y^2 + 2x$ .
- 10) Evaluate  $g(x,y) = (x - 6y) / (x^2 + y^2)$  for the values  $g(3,4)$
- 11) Determine the average value of the function  $f(x) = -2x^2 + 3x + 3$  on the interval  $\{2,5\}$
- 12) Evaluate  $\int_1^3 (2x^5 - 7) / x^2 \, dx$
- 13) Evaluate  $\int_0^2 (2x - x^2) \, dx$

14) Determine the absolute extrema of the function  $f(x) = x^2 - 2x + 4$  on the interval  $[0, 3]$

(15 is missing)

16) Determine the area of the region bounded by  $f(x) = 9 - x^2$  and  $g(x) = 5 - 3x$ .

17) Determine the consumers' surplus for the demand function  $d(x) = 5 - 1/(20x)$  at a demand level  $x = 60$ .

18) Use the Second Derivative Test to locate any relative extrema and saddle points for the function  $f(x, y) = x^3 - 12x + y^2$

19) Determine  $f_y(x, y)$  given  $f(x, y) = 6x + 7x^2y^2 - 5y^2$ .

20) Determine  $\int 1 / x^6 \quad dx$