Homework 2 Part 2 CSC 208 Dykes #15 8 August 12, 2020

1. Find the open intervals on which f(x) = x^2 − 12x is increasing or decreasing. (pp. 9) f(x) = x^2 − 12x 2.

= 2x-12=0 2x=12 x = (+-)6

|  |  |  |  |
| --- | --- | --- | --- |
| Interval |  |  |  |
| Test value | -7 | 0 | 7 |
|  |  |  |  |
| Conclusion | decreasing | decreasing | increasing |

1. Find the open interval on which f(x) = (x^2+1)/x is increasing or decreasing. (pp. 10)

f(x)=x+

=

= 1-

= 1-

X=+-1

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Interval |  |  | 0,1 | 1, |
| Test value | -2 | -1/2 | 1/2 | 2 |
|  |  |  |  |  |
| Conclusion | increasing | decreasing | decreasing | increasing |

1. Find the minimum and maximum values of f(x) = x^2 − 8x + 10 on the open interval

[0, 7] (pp. 20)

f^(x) = 2x-8 x=4

f(0)=10 maximum is 10

f(4) = 6 minimum is 6

f(7) = -3 not max or min

1. If f(x) = 12/x2+4 find concave up or down? (pp. 24)

12/(x^2-4)= 12(x^2-4)^-1

f^(x) = -12(x^2-4)^-2(2x)= -24x/(x^2-4)^2

f^^=

= 0 3x^2=4 x= +- √4/3

|  |  |  |  |
| --- | --- | --- | --- |
| Interval |  |  | √4/3, |
| Test value | -2 | 0 | 2 |
|  |  |  |  |
| Conclusion | Concave upward | Concave downward | Concave Downward |

1. If f(x) = x 4 − 2x 3 + 1 find the point of inflection. (pp. 28)

f’(x) = 4x^3-6x^2 f”(x) = 12x^2-12x=0 = 12x(x-1)=0 x =0,1

|  |  |  |  |
| --- | --- | --- | --- |
| Interval |  |  |  |
| Test value | -1 | 1/2 | 2 |
|  |  |  |  |
| Conclusion | Concave upward | Concave downward | Concave upwards |

1. Determine the dimensions of a rectangular solid with square inches base of maximum value when it’s 150 square inches. (pp. 33)

y=1/2x(75-x^2)

V=x^2y=x^2[1/2x(75-x^2)]=(75/2)x-((x^2)/2)

V’ 75/2 – 3x^2/2

V”=-3x V”=0 x=5 V”(5)=-15<0 x=5 y=5

1. Find the points on the graph of y = 4 − x 2 that are closest to (0,3).

d= √(x-0)^2+(y-3)^2

d=√(x-0)^2+(4-x^2-3)^2 d=√x^2+(1-x^2)^2=√x^4-x^2+1

f(x)= x^4-x^2+1

f’(x)=4x^3-2x

x=0, +- √2/2

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Interval |  |  | 0,√2/2 |  |
| Test value | -1 | -1/2 | 1/2 | 1 |
|  |  |  |  |  |
| Conclusion | decreasing | Increasing | decreasing | increasing |