

For the function shown:

- Determine the intercepts.
- Estimate the local max/min values.
- Estimate the intervals of increase and decrease.
- Estimate the points of inflection.
- Estimate the intervals of concavity.

Handwritten notes:

- a) x-ints: $x = -3, -2, -1$; y-int: -6
- b) Local max: 1 ; Local Min: -1.25 ; -7
- c) Increase: $(-2.5, -1.5) \cup (0.5, \infty)$
Decrease: $(-\infty, -2.5) \cup (-1.5, 0.5)$
- d) PDI: $(-2, 0)$ $(-0.5, 3)$
- e) CU: $(-\infty, -2) \cup (-0.5, \infty)$
CD: $(-2, -0.5)$

Apr 28-7:29 PM

Calculus 120
Unit 4: Applications of Differentiation

May 27, 2019: Day #15

- Related Rate Questions?
- Test Wednesday (Review Today)...start odds and ends tomorrow.
- Calc Challenge Exam....Register by May 31 (Friday)

Jan 9-1:43 PM

Curriculum Outcomes

C8: Use Calculus techniques to sketch the graph of a function.

C9: Use Calculus techniques to solve optimization problems

C11: Use Calculus techniques to solve problems involving related rates.

Jan 24-9:32 AM

Topics to Know:

- Graphing Functions
 - intercepts, asymptotes, domain, intervals of increase and decrease, local max/min values, intervals of concavity, inflection points
 - $f'(x) = 0$ or $f''(x)$ is und. *Table*
 - Inc $(0, 3)$
 - CU $(3, 7)$
 - $y = \frac{(x+3)^2}{2x^2}$
- Optimization Problem
- Related Rate Problem

May 13-6:38 PM

$y = \frac{(x+3)^2}{2x^2}$ Find all V.A & H.A.

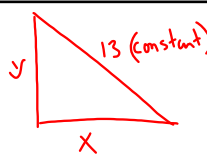
V.A @ $x = 0$

H.A.: $\frac{4x^2 + 12x + 9}{2x^2}$

$\lim_{x \rightarrow \infty} f(x) = \frac{4}{2} = 2$

Notes: Powers equal - divide
Power higher on bottom: ∞
Power higher on top: no horizontal asymptote

May 27-10:14 AM


19. 

$x^2 + y^2 = 169$

$2x \frac{dx}{dt} + 2y \frac{dy}{dt} = 0$

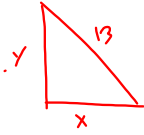
$2(12)(5) + 2(5) \frac{dy}{dt} = 0$

Notes: $x=12, y=5, \frac{dx}{dt}=5, \frac{dy}{dt}=?$



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b)




$x = 12$ $y = 5$
 $\frac{dx}{dt} = 5$ $\frac{dA}{dt} = ?$

$A = \left(\frac{1}{2}x\right)y$
 $\frac{dA}{dt} = \frac{1}{2}x\frac{dy}{dt} + y\left(\frac{1}{2}\right)\frac{dx}{dt}$

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c)

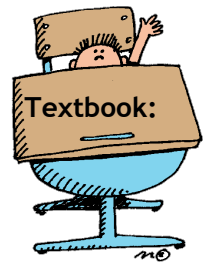


$\frac{dx}{dt} = 5$ $\frac{d\theta}{dt} = ?$
 $x = 12$

$\cos \theta = \frac{x}{13}$
 $\cos \theta = \frac{12}{13}$
 $-\sin \theta \frac{d\theta}{dt} = \frac{1}{13} \frac{dx}{dt}$
 $-\sin \theta \frac{d\theta}{dt} = \frac{1}{13} (5)$

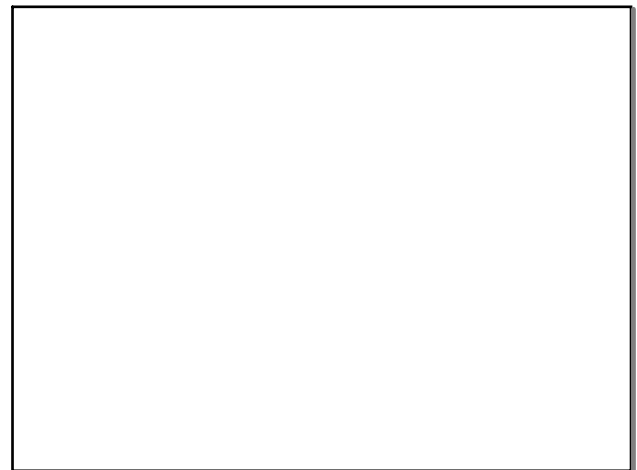
Rad's
 $\cos \theta = \frac{12}{13}$
 $\cos \theta = 0.9231$
 $\theta = \cos^{-1}(0.9231)$
 $\theta = 0.3946$

May 27-10:29 AM



Assignment!
 Go over sample exam questions on these topics?

Jan 13-9:38 PM



May 13-6:46 PM

Attachments

2.1_74_AP.html



2.1_74_AP.swf



2.1_74_AP.html