Haley Carlson

[illegible] Problem

~~3~~2 23.

$l + w + h \leq 62''$ $V = (31 - \frac{1}{2}h)^2$ [illegible]

[illegible]

[illegible]

[illegible] $- h$

$\boxed{V = (6\text{[illegible]})}$

$\frac{dV}{dh} = \text{[illegible]}h - 2\text{[illegible]}h - h^2 = 0$

$\frac{\text{[illegible]}wh}{-2h} = \frac{\text{[illegible]} - 62h}{-2h}$

[illegible] $\frac{\text{[illegible]}}{2} + 31)$

$V = (6\text{[illegible]} - (-\frac{1}{2}h + 31\text{[illegible]})(\frac{\text{[illegible]}}{2} + 31)h$ [illegible]

$V = (31 - \frac{1}{2}h)^2 \cdot h$

[illegible] $(\frac{1}{4}h^2 - 31h + 961)$

$\frac{1}{4}h^3$ [illegible] h

$\frac{dV}{dh} = \frac{3}{4}h^2 - 62h$ [illegible] $= 0$

$h = 20$[illegible].

[illegible] was very [illegible] at first, but I was [illegible]

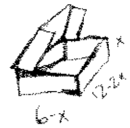
[illegible]

James Allen

Ch 3 review question

$\boxed{3.2}$

#35



Choose x to maximize volume.

Solution: $V = (6-x)(12-2x)x = (72 - 24x + 2x^2)x$

$V = 2x^3 - 24x^2 + 72x$, so $V' = 6x^2 - 48x + 72$

← factor

$V' = 6(x^2 - 8x + 12)$, $6(x-6)(x-2) = 0$

$x = 6, 2$

@ $x = 6$, $V = 0$ ← minimum

so @ $x = 2$ (the max.), $V = 64$

↑ max. value

abs www.allstudents.com

⑥

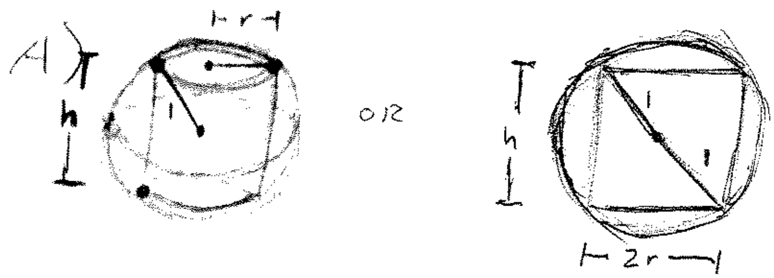
Jesse Lewis

CH 3 Review

3.2 #46

Q) Find the right circular cylinder of largest volume that fits in a sphere of radius 1.

A)



(Put h in terms of r) ⇒

$(2r)^2 + (h)^2 = (2)^2 \Rightarrow h^2 = 4 - 4r^2 \Rightarrow h = 2\sqrt{1-r^2}$

$V_{cyl} = \pi r^2 h \Rightarrow V = \pi r^2 (2\sqrt{1-r^2}) \Rightarrow$

$V = 2\pi r^2 \sqrt{1-r^2}$

$\frac{dV}{dr} = (2\pi r^2)\cdot(-r(1-r^2)^{-\frac{1}{2}}) + (1-r^2)^{\frac{1}{2}}\cdot(4\pi r) \Rightarrow$

$\frac{dV}{dr} = \frac{-2\pi r^3}{\sqrt{1-r^2}} + 4\pi r\sqrt{1-r^2}$; now set $\frac{dV}{dr}$ equal to 0 since we're finding a maximum ⇒

$4\pi r\sqrt{1-r^2} = \frac{2\pi r^3}{\sqrt{1-r^2}} \Rightarrow 4\pi r\cdot(1-r^2) = 2\pi r^3 \Rightarrow$

$4\pi r - 4\pi r^3 - 2\pi r^3 = 0 \Rightarrow 6\pi r^3 - 4\pi r = 0 \Rightarrow$

$r(6\pi r^2 - 4\pi) = 0$;

$r = 0$ $\quad$ $6\pi r^2 - 4\pi = 0 \Rightarrow$

$r^2 = \frac{4\pi}{6\pi} \Rightarrow r^2 = \frac{2}{3} \Rightarrow r = \sqrt{\frac{2}{3}}$

(now plug r $(\sqrt{\frac{2}{3}})$ back into V) ⇒

$V = \pi(\sqrt{\tfrac{2}{3}})^2(2\sqrt{1-(\sqrt{\tfrac{2}{3}})^2}) \Rightarrow \pi(\tfrac{2}{3})(2\sqrt{\tfrac{1}{3}}) \Rightarrow$

$\pi(\frac{2}{3})(\frac{2}{\sqrt{3}}) \Rightarrow \boxed{\frac{4\pi}{3\sqrt{3}}}$ = max volume

(or $\frac{4\pi\sqrt{3}}{9}$ if you want to get that square root out of the denominator)

Alyssa Lolotte
MATH 1270
9/30/2009

Review Chapter 3 problems:

Q. Find dV of a cylinder $h = 7$ and changing from $r = 2$ to $r = 1.9$. What if both h and r change

A.

$V = \pi r^2 \cdot h$

$dV = \pi(2r)\cdot h \cdot dr$

$dV = 2\pi r h \cdot dr$

or...

$V = \pi r^2 \cdot h$

$dV = 2\pi r h \cdot dr + \pi r^2 \cdot 1 \cdot dh$

$dV = 2\pi r h\, dr + \pi r^2 dh$

Why. This problem is good in that you need to think about the best way to find dV when you have both one or two changing variables. It has a real application and demands some thought process!

Alyssa Lolofie
MATH 1270
Review ch. 2

Review Chapter 2:

X. Which of these functions are continuable and why?

$$f_1(x) = \begin{cases} \sin x & x<0 \\ \cos x & x>1 \end{cases} \qquad f_2(x) \begin{cases} \sin \frac{1}{x} & x<0 \\ \cos \frac{1}{x} & x>1 \end{cases}$$

$f_3(x) = \frac{x}{\sin x}$ when $\sin x \neq 0$

$$f_4(x) = x^0 + 0^{x^2}$$

A. $f_1(x)$ = not continuable because there's a break from 0 to 1.

$f_2(x)$ = not continuable because there's a break from 0 to 1.

$f_3(x)$ = not continuable because there is a discontinuity at $x=0$ because $\sin x \neq 0$ for the equation to work correctly

$f_4(x)$ = continuable because $f(0)=1$, the limit exists and $\lim_{x\to 0} f_4(x) = 1$

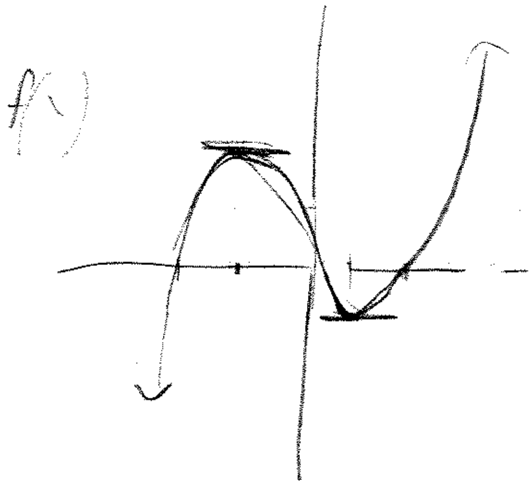
R. This was difficult because you had to think about the rules of having continuous function and then work through them multiple times which then allows me to test my skills!

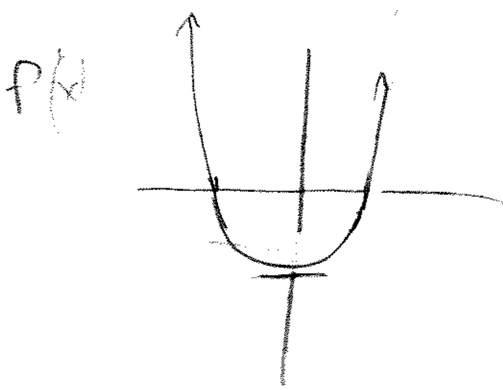
46

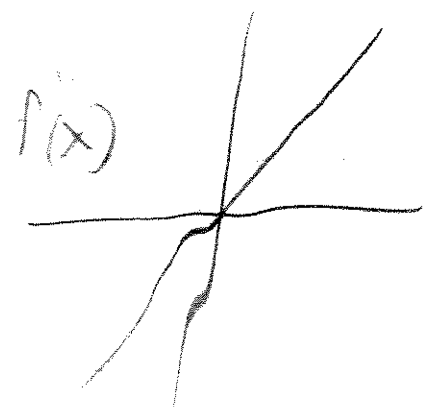
Ch 3 Review Problem

3.3 II 46

Edward Alston







requires students to understand the function and the relationship of the derivative

for additional rigor, the question could involve a new function, then requiring the student to sketch the graph after finding the critical points and then calculating everything accordingly.

Sergio
Diazvela

Ch. 3 Review Problem

3.8 problem 38

$$\frac{f(b)-f(a)}{b-a} = f'(c)$$

$$\underbrace{f(b)-f(a)}_{\text{so the other side must be } > 0} = \underbrace{f'(c)(b-a)}_{\text{This must be positive}}$$

so you set up your new equation up like $f(b)-f(a)>0$. Then you take $f(a)$ over to the other side $\rightarrow f(b)>f(a)$

I chose this problem because you don't have to use numbers to solve it. It shows you that math isn't all about numbers.

Ch3 Best ~~Answers~~ Question Brayden Brassey
3.6

23 You start with a $1,000 and you spend 1/2 of your money every year. Your Aunt gives you a 1000 per year. What is x^* and what would it be for $1,000,000

$2x_{n+1} = x + 1000$
$2x_{n+1} = 1000 + 1000$
$2x_{n+1} = \boxed{2000}$
$x_{n+1} = 1000$
$2x_{n+1} = 1000 + 1000$
$= \boxed{2000}$

$2x_{n+1} = x + 1000$
$2x_{n+1} = 1000,000 + 100$
$x_{n+1} = 501,000$
$2x_{n+1} = \cancel{250750} +$
$\boxed{2x_n \Rightarrow 2800}$

I thought it was a good problem because it applied the concept. ~~&~~ It is also a straitforward problem but it takes a second to set it up to make sense. Also without applying x is the answer 2000 while starting with 1,000,000 ~~[illegible]~~ it wouldnt be normal logic.

Evan Rotin

~~chapter 3 problem~~

3.8

17. $\lim_{x\to\pi} \frac{x-\pi}{\sin x} \frac{d}{dx} \rightarrow \frac{1}{\cos x} \rightarrow \lim_{x\to\pi} \frac{1}{\cos x} = \boxed{-1}$

This problem is a good application of the derivative because you need to use L'Hopital's Rule.

Brendan Haywood
Math 1270

Chapter 3 Review problem

3.8

#36. It has a real life
Situation that is applying
the mean Value
therom (MVT).

$0 \leq x \leq 30$