4/29/2015 (WED.)

CONT. Reviewing for Exam 3 Tomorrow

*(Take calculators To board)

Group 3 To Board (Sherlock Homes & Watson Group) 5's

For Problems (1-4) $f(x) = x^2+3$ ****

Find The 1st derivative of each of The following.

(1.) $f(x)$ | (2.) $\ln(f(x))$ | (3.) $e^{f(x)}$ | (4.) $(\ln(f(x)))e^{f(x)}$

answers:

(1) $f'(x) = 2x$ | (2) $\frac{2x}{(x^2+3)}$ | (3.) $2x(e^{x^2+3})$ | (4.) either $e^{x^2+3}\left(\ln(x^2+3) + \frac{2x}{(x^2+3)}\right)$ OR $2xe^{x^2+3}\left(\ln(x^2+3) + \frac{1}{(x^2+3)}\right)$

(Change To log form)

(5.) $10^2 = 100$ | (6.) $5^3 = 125$ | (7.) $7^{10x} = 117$ then Solve for x in Terms of ln

answers:

$2 = \log_{10} 100$ | $3 = \log_5 125$ | $10x = \log_7 117 = \frac{\ln 117}{\ln 7}$ so $x = \frac{\ln 117}{10 \ln 7} \doteq .245$

Group 1 Brady Bunch

1. $\int 2x(x^2+1)^7\,dx$ 2. $\int_1^2 (x+2)\,dx$ 3. $\int_1^3 (x+2)^3\,dx$

answers

$u = x^2+1$

$du = 2x\,dx$

$\int u^7\,du = \frac{1}{8}u^8 + C$

$= \frac{1}{8}(x^2+1)^8 + C$

$F(x) = \frac{1}{2}x^2 + 2x$

$F(2) = \frac{1}{2}(2)^2 + 2(2)$

$F(2) = 2+4 = 6$

$F(1) = \frac{1}{2}(1)^2 + 2(1) = 2\frac{1}{2}$

$F(2) - F(1) = 6 - 2\frac{1}{2} = 3\frac{1}{2}$

Let $u = x+2$

$du = dx$

when $x = 1$, $u = 3$

when $x = 3$, $u = 5$

#3 cont.

$\int_3^5 u^3\,du$

$F(u) = \frac{1}{4}u^4$

$F(5) = \frac{625}{4}$

$F(3) = \frac{81}{4}$

$F(5) - F(3) = \frac{625}{4} - \frac{81}{4}$

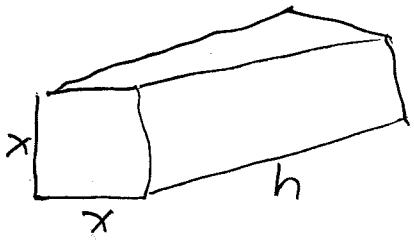
$= \frac{544}{4}$

$= 136$

Group 1 Brady Bunch last problem
Opt. II like #12

(4-7)
like #12 Parcel Post Regulations
change 108 in to 150 in

FIND
The largest volume that may be sent via Priority mail.



Hint: $4x+h$ (length plus the girth)

and $V = Bh$ (B = Area of the base)

Solution: $4x+h = 150$

$h = 150 - 4x$

#4 $V = x^2h = x^2(150-4x) = 150x^2 - 4x^3$

$V' = 300x - 12x^2 = 0$

#5 $12x(25 - x^2) = 0$

$x^2 = 25$

$x = 0$ or $x = 5$ (x cannot be -5)

interval $x \geq 0$ and $h \geq 0$

so $150 - 4x \geq 0$

$-4x \geq -150$

$x \leq 37.5$

#6 $[0, 37.5]$

which is largest

$V(0)$ 0

$V(5)$ $3250\ in^3$

$V(37.5)$ 0

#7 Answer

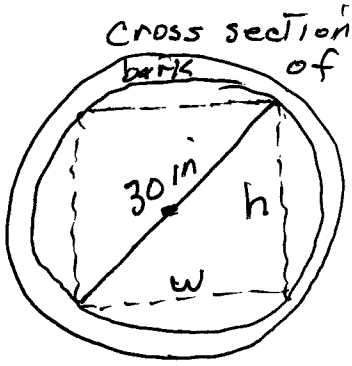
so $x = 5$ in

$h = 130$ in

gives max. Vol. $3,250\ in^3$

Group 2 The A-Team To board

(1-4) Like #25



strength S

$S = Kh^2w$ where K is a constant

Find dimensions of strongest beam.

Note: $h^2 + w^2 = 30^2$

$h^2 = (900 - w^2)$

substituting

(#1) $S = Kw(900 - w^2)$

$S = K(900w - w^3)$

(#2) $S' = 900 - 3w^2 = 0$

$w^2 = 300$

$w = \sqrt{300}$ because cannot be negative $\sqrt{300}$

(#3) Note: $S'' = -6Kw < 0$ so gives maximum

find h if $w = \sqrt{300}$

$h^2 = 900 - w^2 = 900 - (\sqrt{300})^2 = 900 - 300$

$h^2 = 600$

$h = \sqrt{600}$

(#4)

So $w = \sqrt{300} \approx 17.32$ in and $h = \sqrt{600} \approx 24.495$ in would give the strongest beam