

Math 203 Quiz 2B
September 1, 2015

Name: ANSWERS

Instructions: No calculators! Answer all problems in the space provided!

1. Compute the following derivatives:

(b) $\frac{d}{dx} 3 \tan 2x = \underline{6 \sec^2 2x}$ (b) $\frac{d}{dx} \frac{5}{(1-x^3)^2} = \underline{\frac{30x^2}{(1-x^3)^3}}$

(d) $\frac{d}{dx} 3y^2z(x^3-1)^4 = \underline{36x^2y^2z(x^3-1)^3}$ (d) $\frac{d}{dx} (x \ln x - x) = \underline{\ln x}$

2. Evaluate the following integrals:

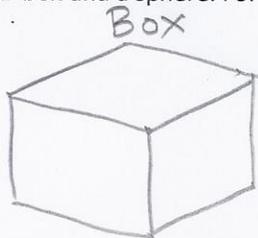
(a) $\int \cos^2 x \, dx = \underline{\frac{1}{2}(x + \frac{1}{2} \sin 2x) + C}$ (b) $\int 3x^2 e^x \, dx = \underline{3x^2 e^x - 6x e^x + 6e^x + C}$

(c) $\int \cos^2 x \sin^3 x \, dx = \underline{\frac{\cos^5 x}{5} - \frac{\cos^3 x}{3} + C}$ (b) $\int \frac{4r}{\sqrt{1+r^2}} \, dr = \underline{4\sqrt{1+r^2} + C}$

3. Complete the following polar coordinate formulas:

(b) $x = \underline{r \cos \theta}$ (b) $y = \underline{r \sin \theta}$ (c) $r^2 = \underline{x^2 + y^2}$

4. Draw a rectangular box and a sphere. For the sphere, indicate the radius, center and equator on your sketch.



5. Sketch the region bounded by $y = x^2$ and $y = 2 - x$. Find the intersecting points and identify them on your sketch. Shade the enclosed region.

$$\begin{aligned} x^2 &= 2 - x \\ \Rightarrow x^2 + x - 2 &= 0 \\ \Rightarrow (x+2)(x-1) &= 0 \\ \Rightarrow x = -2, x = 1 \\ (-2, 4), (1, 1) \end{aligned}$$

