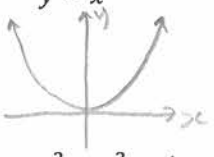
Out of 42
↓
the answer to life, the universe and everything.
I swear this was a coincidence!

Math 203 Quiz 1
June 2, 2014

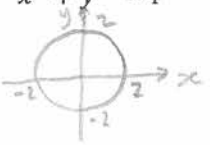
Name: JHEVON SMITH

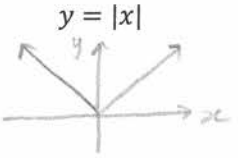
Instructions: No calculators! Answer all problems in the space provided!

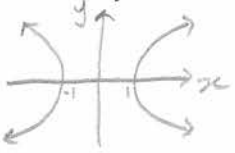
1. Sketch the following below the equations.

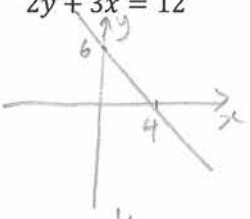
$y = x^2$ 

$y = x^3$ 

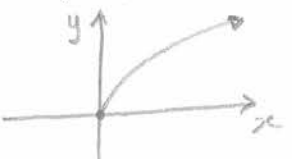
$x^2 + y^2 = 4$ 

$y = |x|$ 

$x^2 - y^2 = 1$ 

$2y + 3x = 12$ 

$y = e^x$ 

$y = \sqrt{x}$ 

2. Evaluate:

(a) $\sin\frac{\pi}{6} =$ $\frac{1}{2}$ (b) $\cos\frac{4\pi}{3} =$ $-\frac{1}{2}$ (c) $\tan^{-1} 1 =$ $\frac{\pi}{4}$ (d) $\ln 1 =$ 0 (e) $\ln 0 =$ DNE

(f) $\ln e^{x^3} =$ x^3 (g) $\sin\frac{\pi}{12} =$ $\frac{\sqrt{2}}{4}(\sqrt{3}-1)$ or $\frac{\sqrt{2}\cdot\sqrt{3}}{2}$ (h) $e^{2\ln(3x)} =$ $9x^2$ (i) $\sqrt{6^2+8^2} =$ 10

3. A right triangle has a hypotenuse of length b, and legs of lengths a and c.
   (a) State Pythagoras' theorem for this triangle $a^2 + c^2 = b^2$
   (b) Angle A for the above triangle has magnitude θ. In terms of the given side lengths, what is:
   (i) $\sin\theta =$ a/b (ii) $\cos\theta =$ c/b (iii) $\tan\theta =$ a/c (iv) $\csc\theta =$ b/a (v) $\sec\theta =$ b/c
   (c) Suppose you were only told the length of the hypotenuse is b and an acute angle is θ. In terms of b and θ, find the length of:
   (i) Opposite side to θ $b\sin\theta$ (ii) Adjacent side to θ $b\cos\theta$

4. For an arbitrary triangle ABC, state:
   (a) The law of sines $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$ or $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$
   (b) $a^2 =$ $b^2 + c^2 - 2bc\cos A$ (by the law of cosines)

5. Compute/Evaluate/Write down:

(a) $\frac{d}{dx}x^n =$ nx^{n-1} (b) $\int \ln x\, dx =$ $x\ln x - x + C$ (c) $\frac{d}{dx}e^{f(x)} =$ $f'(x)e^{f(x)}$ (d) $\lim_{x\to 0}\frac{\sin x}{x} =$ 1

(e) $\frac{d}{dx}\ln f(x) =$ $\frac{f'(x)}{f(x)}$ (f) $\frac{d}{dx}(x^3 + 2x + 5)^7 =$ $7(x^3+2x+5)^6(3x^2+2)$ (g) $\int \frac{1}{2x+1}dx =$ $\frac{1}{2}\ln|2x+1| + C$

(h) $\frac{d}{dx}\sec^2 x =$ $2\sec^2 x \tan x$ (i) $\int \sec^2 x\, dx =$ $\tan x + C$ (j) $\int \cos x\, dx =$ $\sin x + C$

6. (a) Evaluate $\int_1^3 x^2 + 1\, dx =$ $32/3$
   (b) What's an interpretation of the answer to (a)? The area "under" the curve x^2+1 on the interval $[1, 3]$

7. In polar coordinates: $x =$ $r\cos\theta$ $y =$ $r\sin\theta$ $r^2 =$ $x^2 + y^2$