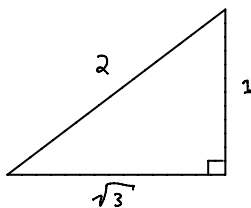
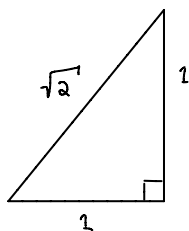


Review of Differentiation

Directions: Complete the worksheet. The only resources allowed are your peers, so work together and see how far you can get!

1) a) Fill in the angles into the following 2 triangles:



b) Use the above triangles to fill in the following table.

θ	$\sin \theta$	$\cos \theta$
$\pi/6$		
$\pi/4$		
$\pi/3$		
$2\pi/3$		
$3\pi/4$		
$5\pi/6$		
$7\pi/6$		
$5\pi/4$		
$4\pi/3$		
$5\pi/3$		
$7\pi/4$		

c) What is $\sin \theta$ and $\cos \theta$ for $\theta = 0, \pi/2, \pi, 3\pi/2$?

2) Write down the limit definition of the derivative.

3) Write down the following derivative rules (for example, for linearity, you would write $\frac{d}{dx}(f+g) = \frac{df}{dx} + \frac{dg}{dx}$ or $(f+g)' = f' + g'$).

a) The power rule:

b) The product rule:

c) The chain rule:

4) Fill in the following derivatives:

$$\frac{d}{dx} \sin x =$$

$$\frac{d}{dx} \cos x =$$

$$\frac{d}{dx} \tan x =$$

$$\frac{d}{dx} \sec x =$$

5) Calculate the following derivatives:

a) $\frac{d}{dx} (3x^5 + x^2 - 7x + \frac{1}{x})$

b) $\frac{d}{dx} \cos(2x^3)$

c) $\frac{d}{dx} x^7 \sin x$

d) $\frac{d}{dx} x \sin(x^2)$

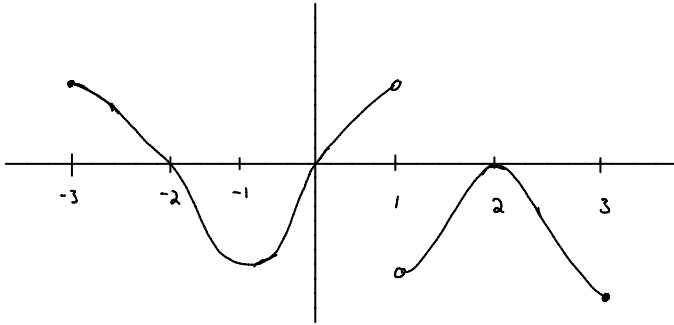
e) $\frac{d}{dx} \sqrt{x \sin(x^2)}$

6) a) What does it mean for a number c to be a critical number of a function f ?

b) Find the critical numbers of $f(x) = \frac{1}{3}x^3 - 3x^2 + 8x + 9$

7) Let f be a continuous function on $[-3, 3]$.

Below is the graph of f .



a) List the critical numbers of f .

b) At what values of x does f have a local maximum?

c) _____ " _____ minimum?

d) In what intervals is f increasing? Decreasing?

e) Does f have an absolute maximum on $[1, 3]$? An absolute min?