Pre-	Calcı	ılus	12B
------	-------	------	-----



Name:_ November 2016

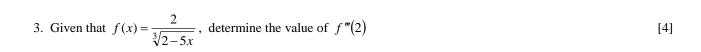
1. Given that $f(x) = \sqrt{5x-1}$ use the **definition of a derivative** to find f'(2). (No other method will be accepted!)

[6]

2. Differentiate each of the following:
(a)
$$f(x) = \tan(3x-5)^3 - \sec^4 2x^5$$

[8]

(b) $y = \frac{\cos^2 5x - \sin x^5}{\cot \sqrt{1 - x^2}}$



4. Determine the equation of the tangent line drawn to the curve
$$x^2 - 2xy = x^2y - 3x$$
 at the ordered pair $(-1,2)$. [5]

5. Find the *x*-intercept of the tangent line drawn to the curve
$$f(x) = \frac{1-3x^3}{\sqrt{x+5}}$$
 at the point where $x = -1$. [6]

to the line $3y-2x+6=0$.	[6]
7. A particle moves along a vertical line in such a way that at time t seconds after the start, the particle is located $s = 2t^3 - 21t^2 + 36t + 3$ metres from its starting position, where $t \ge 0$.	d
(a) What is the velocity of the particle when the acceleration is equal to 18 m/s ² ?	[4]
(b) Determine the acceleration of the particle the instant it changes direction for the second time.	[4]
(b) Betermine the deceleration of the particle the instant it changes direction for the second time.	[,]
(c) What is the total distance traveled by the particle over the first 24 seconds.	[4]
Commission and the second seco	ניז

6. Find the points on the curve $y = \cos x - 2x$, $0 < x < 2\pi$, where a tangent to the curve would be perpendicular