3-20-14

3rd Try

Ch. 7 Review

Derivatives

① $2x^{-4} - 8x^{-2}$

$f'(x) = -8x^{-5} + 16x^{-3}$

$= \frac{-8}{x^5} + \frac{16}{x^3}$

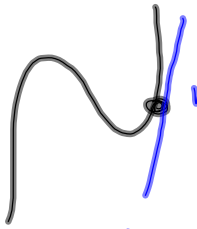
② $f(x) = \frac{3}{x^3} + \frac{x^2}{4}$

$= 3x^{-3} + \frac{1}{4}x^2$

$f'(x) = -9x^{-4} + \frac{1}{2}x$

$\frac{-9}{x^4} + \frac{x}{2}$

③ Give slope of the line tangent to $f(x) = x^3 - x + 1$ at $(1,1)$.



$m = 2$

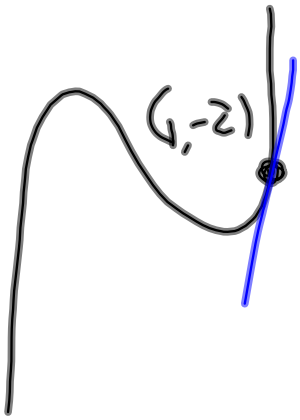
$f'(x) = 3x^2 - 1$

$f'(1) = 3(1)^2 - 1 = 2$

④ Give the equation of the tangent line to $f(x) = 2x^3 - 4$ at $(1, -2)$.

$f'(x) = 6x^2$

$f'(1) = 6 \cdot 1^2 = 6$



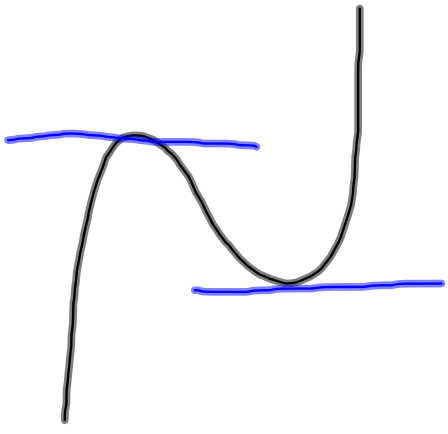
$y - y_1 = m(x - x_1)$

$y + 2 = 6(x - 1)$

$y + 2 = 6x - 6$

$-2 \quad -2$

$y = 6x - 8$



Find critical points on

$f(x) = x^3 + 6x^2 + 9x$

$f'(x) = 3x^2 + 12x + 9$

$3x^2 + 12x + 9 = 0$

$\frac{3(x^2+4x+3)}{3} = \frac{0}{3}$

$x^2 + 4x + 3 = 0$

$(x+3)(x+1) = 0$

$x = -3 \qquad x = -1$

$f(-3) = (-3)^3 + 6(-3)^2 + 9(-3)$

$= 0$

$(-3, 0)$

$f(-1) = (-1)^3 + 6(-1)^2 + 9(-1)$

$= -4$

$(-1, -4)$

$f''(x) = 6x + 12$

$6x + 12 = 0$

$x = -2$

$f(-2) = (-2)^3 + 6(-2)^2 + 9(-2)$

$(-2, -2)$

3-20-14
4th Trig

Ch. 7 Review

Derivatives

① $f(x) = 2x^{-8} + x^{-1}$

$f'(x) = -16x^{-9} - 1x^{-2}$

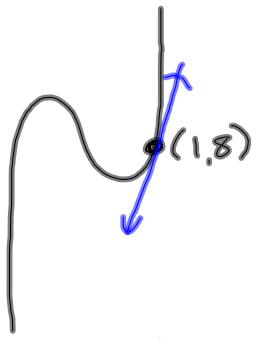
$= \frac{-16}{x^9} - \frac{1}{x^2}$

② $f(x) = \frac{2}{x^4} + \frac{3}{x^9} - \frac{x^2}{2}$

$= 2x^{-4} + 3x^{-9} - \frac{1}{2}x^2$

$f'(x) = -8x^{-5} - 27x^{-10} - x$

$= \frac{-8}{x^5} - \frac{27}{x^{10}} - x$



③ What is the slope of the line tangent to $f(x) = x^3 + 8x - 1$ at $(1,8)$

$f'(x) = 3x^2 + 8$

$f'(1) = 3 \cdot 1^2 + 8 = 11$

④ Give the equation of the line that is tangent to $f(x) = 2x^3 - 8x$ at $(1, -6)$

$f'(x) = 6x^2 - 8$

$f'(1) = 6 \cdot 1^2 - 8 = -2$

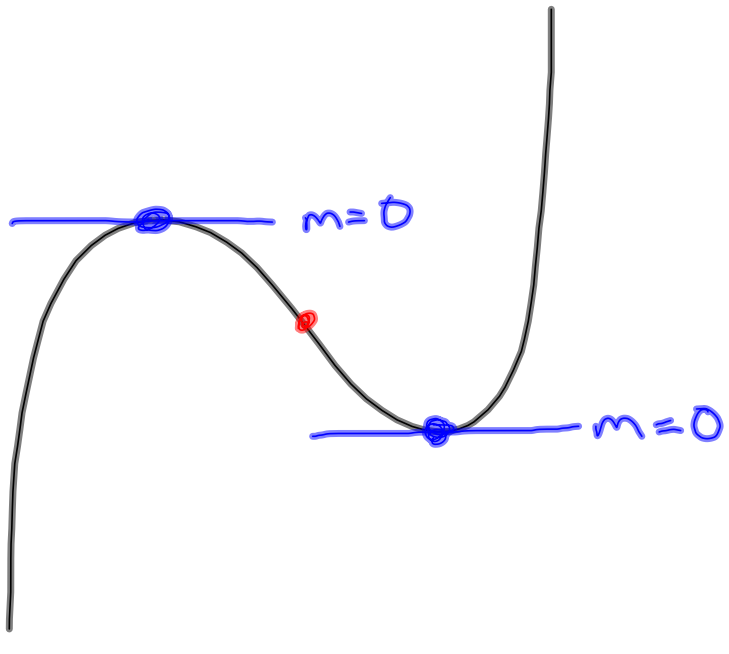
$y - y_1 = m(x - x_1)$

$y + 6 = -2(x - 1)$

$y + 6 = -2x + 2$

$-6 \qquad -6$

$y = -2x - 4$



Give critical points for

$f(x) = x^3 + 6x^2 + 9x.$

$f'(x) = 3x^2 + 12x + 9$

$3x^2 + 12x + 9 = 0$

$3(x^2 + 4x + 3) = 0$

$(x+3)(x+1) = 0$

$x = -3 \qquad x = -1$

$f(-3) = (-3)^3 + 6(-3)^2 + 9(-3)$

$= 0 \qquad (-3, 0)$

$f(-1) = (-1)^3 + 6(-1)^2 + 9(-1)$

$= -4 \qquad (-1, -4)$

$f''(x) = 6x + 12$

$6x + 12 = 0$

$x = -2$

$f(-2) = (-2)^3 + 6(-2)^2 + 9(-2)$

$= -2$

$(-2, -2)$