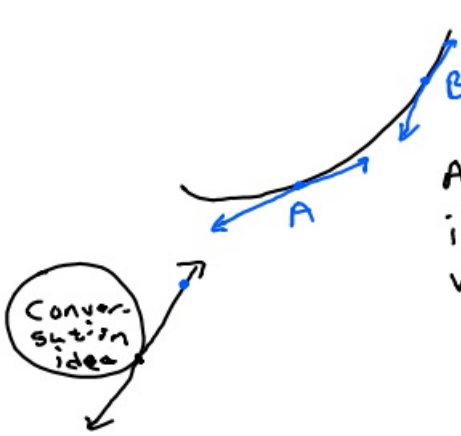
1-22-20 1st Trig



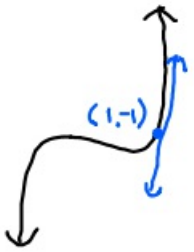
At which point if we zoom in would have a stepper slope?

① Find the slope of the tangent line to $f(x) = 6x^3 - 2x - 5$ at $(1,-1)$

$f'(x) = 18x^2 - 2$

$f'(1) = 18 \cdot 1^2 - 2 = 16$

Slope is 16

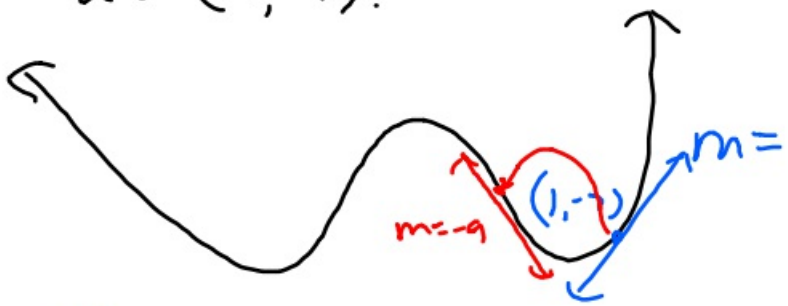


② Give the slope of the line tangent to $f(x) = 2x^3 - 6x$ at the point $(2,6)$.

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

$f'(2) = 6 \cdot 2^2 - 6 = 18$

(3) Give the slope of the tangent line to $f(x) = x^4 - 3x^3 - 2x^2 - 3$ at $(1, -7)$.



$f'(x) = 4x^3 - 9x^2 - 4x$

$f'(1) = 4 \cdot 1^3 - 9 \cdot 1^2 - 4(1) = -9$

(4) $f(x) = \frac{6}{x^1}$ at $(2, 3)$

Rewrite

$f(x) = 6x^{-1}$

$f'(x) = -6x^{-2}$

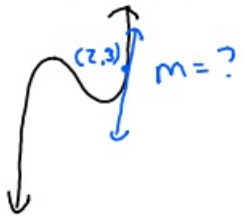
$f'(x) = \frac{-6}{x^2}$

$f'(2) = \frac{-6}{2^2} = \frac{-6}{4} = -\frac{3}{2}$

(-1.5)

Let's now find the equation of the tangent line.

④ Find eq. of tangent line to $f(x) = x^3 - 3x + 1$ at $(2,3)$.



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

$f'(2) = 3 \cdot 2^2 - 3 = 9$

we want eq. that has a slope of 9 and goes through $(2,3)$.

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

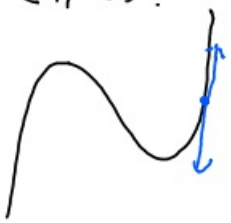
$y - 3 = 9(x - 2)$

$y - 3 = 9x - 18$

$+3 \quad +3$

$y = 9x - 15$

⑤ Give the eq. of the line tangent to $f(x) = x^3 - x^2 - 5$ at $(1, -5)$.



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

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

$y - y_1 = m(x - x_1)$ $(1, -5)$

$y - -5 = 1(x - 1)$

$y + 5 = x - 1$

$-5 \quad -5$

$y = x - 6$

⑥ Give eq. of the line that is tangent to $f(x) = x^4 + 3x - 1$ at $(1, 3)$.

$f'(x) = 4x^3 + 3$

$f'(1) = 4(1)^3 + 3$

$= 7$

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

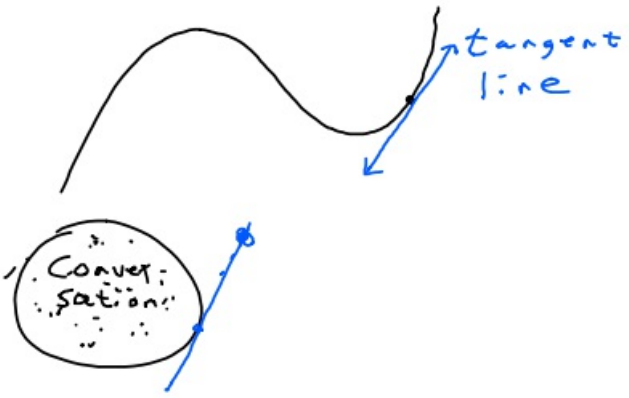
$y - 3 = 7(x - 1)$

$y - 3 = 7x - 7$

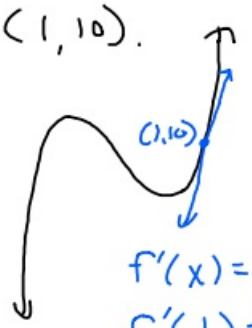
$+3 \qquad +3$

$y = 7x - 4$

1-22-20 3'' Trig



① Give the slope of the line tangent to $f(x) = 4x^3 + 6x$ at $(1, 10)$.

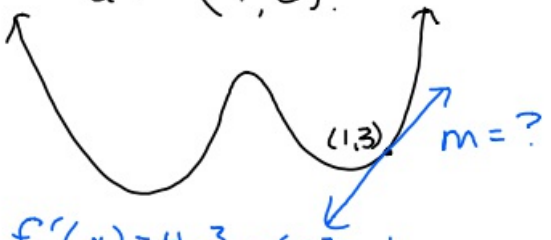


$f'(x) = 12x^2 + 6$

$f'(1) = 12 \cdot 1^2 + 6 = 18$

slope is 18.

② What is the slope of the tangent line to $f(x) = x^4 + 2x^3 + x^1 - 1$ at $(1, 3)$.



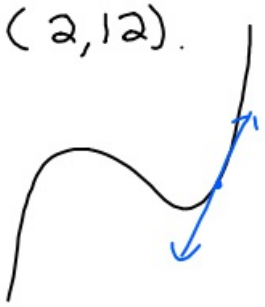
$f'(x) = 4x^3 + 6x^2 + 1$

$f'(1) = 4 \cdot 1^3 + 6 \cdot 1^2 + 1 = 11$

③ Give the slope of the line tangent to

$f(x) = x^3 - x^2 - x + 10$

at $(2,12)$.



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

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

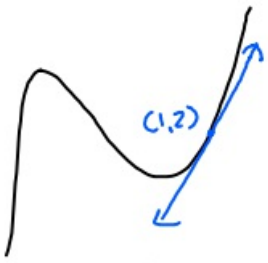
$12 - 4 - 1$

$= 7$

Slope is 7.

④ Give the equation of the line tangent to

$f(x) = x^3 - 4x^2 + 5$ at $(1,2)$



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

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

Slope $= -5$ $(1,2)$

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

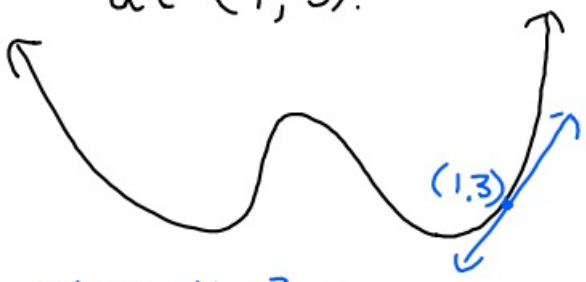
$y - 2 = -5(x - 1)$

$y - 2 = -5x + 5$

$+2 \qquad +2$

$y = -5x + 7$

⑤ Give the equation of the line tangent to $f(x) = x^4 + 3x - 1$ at $(1,3)$.



$f'(x) = 4x^3 + 3$

$f'(1) = 4 \cdot 1^3 + 3 = 7$

slope = 7 Point $(1,3)$

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

$y - 3 = 7(x - 1)$

$y - 3 = 7x - 7$

$+3 \quad +3$

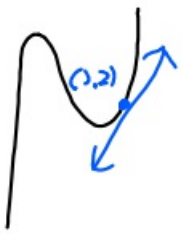
$y = 7x - 4$

⑥ Give the eq. of the line tangent to $f(x) = x^3 + 6x^2 - 5$ at $(1,2)$.

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

$f'(1) = 3 \cdot 1^2 + 12 \cdot 1$

slope = 15 $(1,2)$



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

$y - 2 = 15(x - 1)$

$y - 2 = 15x - 15$

$+2 \quad +2$

$y = 15x - 13$