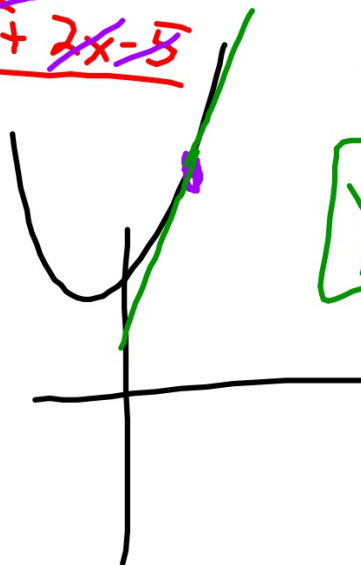


$$3x^2 - 2x + 5 \text{ at } x=4$$

$$\lim_{h \rightarrow 0} \frac{3(x+h)^2 - 2(x+h) + 5 - (3x^2 - 2x + 5)}{h}$$

$$\frac{6xh + 3h^2 - 2x - 2h + 5 - 3x^2 + 2x - 5}{h}$$

$$\frac{6xh + 3h^2 - 2h}{h} = \lim_{h \rightarrow 0} (6x + 3h - 2)$$



$$b) m = 6(4) - 2$$

$$c) y = mx + b$$

$$45 = 22(4) +$$

$$45 = 88 + b$$

$$-43 = b$$

$$y = 22x - 43$$

$$\frac{3}{x} \text{ at } x=3$$

$$\frac{3x}{(x+h)x} + \frac{-3(x+h)}{x(x+h)}$$

$$\frac{-3h}{h}$$

$$= \lim_{h \rightarrow 0}$$

$$\frac{-3\cancel{h}}{x(x+h)} \cdot \frac{1}{\cancel{h}}$$

$$\boxed{\frac{-3}{x^2} = m_{tan}}$$

$$b) m = \frac{-3}{3^2} = -\frac{1}{3}$$

$$c) y = mx + b$$

$$1 = \cancel{\frac{-1}{3}} 3 + b$$

$$1 = -1 + b$$

$$2 = b$$

$$\boxed{y = -\frac{1}{3}x + 2}$$

$$\frac{x}{x-2} \text{ at } x=3$$

$$b) m = \frac{-2}{(3-2)^2} = -2$$

$$\frac{(x+h)(x-2) - x(x+h-2)}{(x+h-2)(x-2)}$$

$$\frac{\cancel{x-2}h - \cancel{x^2} - \cancel{x}h + \cancel{2x}}{(x-2)(x-2)} \quad \frac{3}{3-2}$$

$$\lim_{h \rightarrow 0} \frac{h}{(x+h-2)(x-2)} = -2$$

$$c) y = mx + b$$

$$3 = -2(3) + b$$

$$3 = -6 + b$$

$$9 = b$$

$$y = -2x + 9$$

$$2x^3 - 3 \text{ at } x = 3$$

$$\frac{2(x+h)^3 - 3 - (2x^3 - 3)}{h}$$

$$\frac{2(x^3 + 3x^2h + 3xh^2 + h^3) - 3 - 2x^3 + 3}{h}$$

$$\frac{2x^3 + 6x^2h + 6xh^2 + 2h^3 - 3 - 2x^3 + 3}{h}$$

$$\frac{6x^2h + 6xh^2 + 2h^3}{h} = \lim_{h \rightarrow 0} (6x^2 + 6xh + 2h^2)$$

$$(x+h)(x^2 + 2xh + h^2)$$

$$x^3 + 2x^2h + xh^2 + x^2h$$

$$m_{\text{tan}} = 6x^2$$

$$b) m =$$

$$m =$$

$$c) y = mx + b$$

$$-57 = 54(-3) + b$$

$$-57 = -162 + b$$

$$105 = b$$

$$y = 54x + 105$$

$$\sqrt{2x+3} \text{ at } x=3$$

$$\frac{\sqrt{2(x+h)+3} - \sqrt{2x+3}}{h} = \lim_{h \rightarrow 0} \frac{(\sqrt{2x+2h+3} - \sqrt{2x+3}) (\sqrt{2x+2h+3} + \sqrt{2x+3})}{h (\sqrt{2x+2h+3} + \sqrt{2x+3})}$$

$$\frac{(\cancel{2x+3} + \cancel{2x+3} + 2h) - (\cancel{2x+3} + \cancel{2x+3})}{h (\sqrt{2x+2h+3} + \sqrt{2x+3})} = \frac{2h}{h (\sqrt{2x+2h+3} + \sqrt{2x+3})}$$

$$\frac{2}{\sqrt{2x+3} + \sqrt{2x+3}} = \frac{1}{\sqrt{2x+3}}$$

$$\frac{1}{3} = m$$

$$c) y = mx + b$$

$$3 = \frac{1}{3} \cdot 3 + b$$

$$3 = 1 + b$$

$$2 = b$$

$$y = \frac{1}{3}x + 2$$

$$\frac{3}{x^2} \text{ at } x=3$$

$$\frac{3 \cdot x^2 - 3(x^2 + 2xh + h^2)}{h^2 \cdot x^2 \cdot x^2(x+h)^2}$$

$$\frac{h^2}{x^2 - 6xh - 3h^2}$$

$$\frac{h^2}{h^2 \cdot x^2}$$

$$\frac{3h^2}{h^2} \cdot \frac{1}{h} \lim_{h \rightarrow 0} \frac{-6x - 3h}{(x+h)^2 \cdot x^2} = \frac{-6x}{x^4}$$

$$= \frac{-6}{x^3}$$

$$b) m = \frac{-6}{3^3} = \frac{-6}{27} = \frac{-2}{9}$$

$$c) y = mx + b$$

$$\frac{1}{3} = \frac{-2}{9} \cdot 3 + b$$

$$\frac{1}{3} = \frac{-2}{3} + b$$

$$1 = b$$

$$y = \frac{-2}{9}x + 1$$

$$x^2 + 1 \quad \text{at } x = 2$$

$$\lim_{h \rightarrow 0} \frac{(x+h)^2 + 1 - (x^2 + 1)}{h}$$

$$\frac{h + h^2 + 1 - x^2 - 1}{h}$$

$$= \lim_{h \rightarrow 0} 2x + h = 2x = m_{\text{tan}}$$

$$b) m = 2 \cdot 2 = 4$$

$$c) y = mx + b$$

$$5 = 4(2) + b$$

$$5 = 8 + b$$

$$-3 = b$$

$$y = 4x - 3$$

$$x^3 - 2 \quad \text{at } x = 1$$

$$\frac{(x+h)^3 - 2 - (x^3 - 2)}{h}$$

$$\frac{+3xh^2 + h^3 - \cancel{2} - \cancel{x^3} + \cancel{2}}{h}$$

$$3xh^2 + h^3$$

$$h + h^2 = 3x^2 = m_{\text{tan}}$$

$$(x+h)(x^2 + 2xh + h^2)$$

$$x^3 + 2x^2h + xh^2 + x^2h +$$

$$b) m = 3(1)^2 = 3$$

$$c) y = mx + b$$

$$-1 = 3(1) + b$$

$$-1 = 3 + b$$

$$-4 = b$$

$$y = -3x - 4$$

$$3x^2 - 2x + 5 \text{ at } x=4$$

$$\frac{3(x+h)^2 - 2(x+h) + 5 - (3x^2 - 2x + 5)}{h}$$

$$\frac{3x^2 + 6xh + 3h^2 - 2x - 2h + 5 - 3x^2 + 2x - 5}{h}$$

$$\frac{6xh + 3h^2 - 2h}{h} = \lim_{h \rightarrow 0} (6x + 3h - 2)$$

$$b) m = 6(4) - 2 = 22$$

$$c) y = mx + b$$

$$45 = 22(4) + b$$

$$45 = 88 + b$$

$$-43 = b$$

$$\boxed{y = 22x - 43}$$

$$\frac{3}{x} \text{ at } x = 3$$

$$\frac{\frac{3x}{(x+h) \cdot x} - \frac{3(x+h)}{x(x+h)}}{3h} \cdot h$$

$$\frac{1}{h}$$

$$\frac{-3}{x^2} = m_{t=1}$$

$$b) m = \frac{-3}{3^2} = -\frac{1}{3}$$

$$c) y = mx + b$$

$$1 = -\frac{1}{3}(3) + b$$

$$1 = -1 + b$$

$$2 = b$$

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

$$\frac{x}{x-2} \text{ at } x=3$$

$$\frac{(x+h)(x-2) - x(x+h-2)}{(x-2)(x-2)}$$

$$\frac{h}{(x-2)(x-2)}$$

$$\frac{h}{(x-2)^2}$$

$$\lim_{h \rightarrow 0} \frac{h}{(x-2)^2} = \frac{-2}{(3-2)^2} = -2$$

$$b) m = \frac{-2}{(3-2)^2} = -2$$

$$c) y = mx + b$$

$$3 = -2(3) + b$$

$$3 = -6 + b$$

$$9 = b$$

$$y = -2x + 9$$

$$x^3 - 3 \text{ at } x = -3$$

$$\frac{(x^3 + 3x^2h + 3xh^2 + h^3) - (2x^3 - 3)}{h}$$

$$\frac{x^2h + 6xh^2 + 2h^3 - 3 - 2x^3 + 3}{h}$$

$$\frac{x^2h + 2h^3}{h}$$

$$\cancel{hx^2} = 6x^2 = m_{\text{tan}}$$

$$b) m = 6(-3)^2 = 54$$

$$c) y = mx + b$$

$$= 54(-3) + b$$

$$-57 = -162 + b$$

$$105 = b$$

$$y = 54x + 105$$

$\sqrt{2x+3}$ at $x=3$

$$\frac{\sqrt{2(x+h)+3} - \sqrt{2x+3}}{h} = \lim_{h \rightarrow 0} \frac{\sqrt{2x+2h+3} - \sqrt{2x+3}}{h} \cdot \frac{\sqrt{2x+2h+3} + \sqrt{2x+3}}{\sqrt{2x+2h+3} + \sqrt{2x+3}}$$

$$\frac{\cancel{+3} - \cancel{2x+3} + \sqrt{2x+2h+3} + \sqrt{2x+3}}{(\sqrt{2x+2h+3} + \sqrt{2x+3})}$$

$$\frac{\sqrt{2x+2h+3} + \sqrt{2x+3}}{(\sqrt{2x+2h+3} + \sqrt{2x+3})}$$

$$\frac{2}{(\sqrt{2x+2h+3} + \sqrt{2x+3})} = \frac{2}{2\sqrt{2x+3}} = \frac{1}{\sqrt{2x+3}}$$

$$b) m = \frac{1}{\sqrt{2 \cdot 3 + 3}} = \frac{1}{3}$$

$$c) y = mx + b$$

$$= \frac{1}{3}(3) + b$$

$$3 = 1 + b$$

$$2 = b$$

$$y = \frac{1}{3}x + 2$$