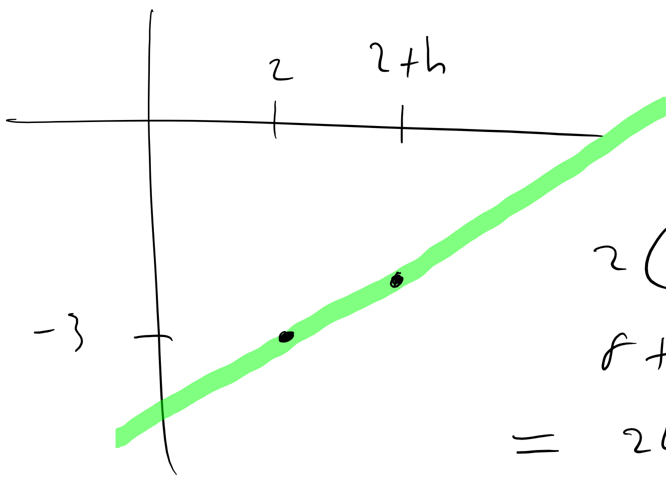
(2) $f(x) = 2x^2 - 3x - 5$

slope of secant line thru $(2, f(2))$ and $(2+h, f(2+h))$ is $2h+5$.



$f(2+h) = ?$

$f(2+h) = 2(2+h)^2 - 3(2+h) - 5$

$2(4+4h+h^2) - 6 - 3h - 5$

$8 + 8h + 2h^2 - 6 - 3h - 5$

$= 2h^2 + 5h - 3$

$$\text{slope} = \frac{f(2+h) - f(2)}{h} = \frac{2h^2 + 5h - 3 - -3}{h}$$

$$\frac{2h^2 + 5h}{h} = 2h + 5$$

4) secant - slope thru $(2, f(2))$ and $(3, f(3))$ $h = 1$

$$\text{slope} = 7 \qquad \frac{f(3) - f(2)}{3-2}$$

5) slope of tangent line $=$ $\lim\limits_{h \to 0} 2h+5$ $\quad 5$

4 $f(x) = x^2 + 9x \qquad a = 2$

$$f'(a) = \lim_{x \to a} \frac{f(x) - f(a)}{x - a}$$

$$= \frac{(x^2 + 9x) - 22}{x - 2} = \frac{x^2 + 9x - 22}{x - 2}$$

$$= \frac{(x + 11)(x - 2)}{x - 2} = x + 11 \to 13$$

$$\lim_{h \to 0} \frac{f(a+h) - f(a)}{h} = f'(a) \qquad a = 2$$

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

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

$$f(2+h) = (2+h)^2 + 9(2+h)$$
$$= 4 + 4h + h^2 + 18 + 9h$$
$$= h^2 + 13h + 22$$

$$\lim_{h \to 0} \frac{h^2 + 13h + 22 - 22}{h}$$

$$= h + 13 \rightarrow 13$$