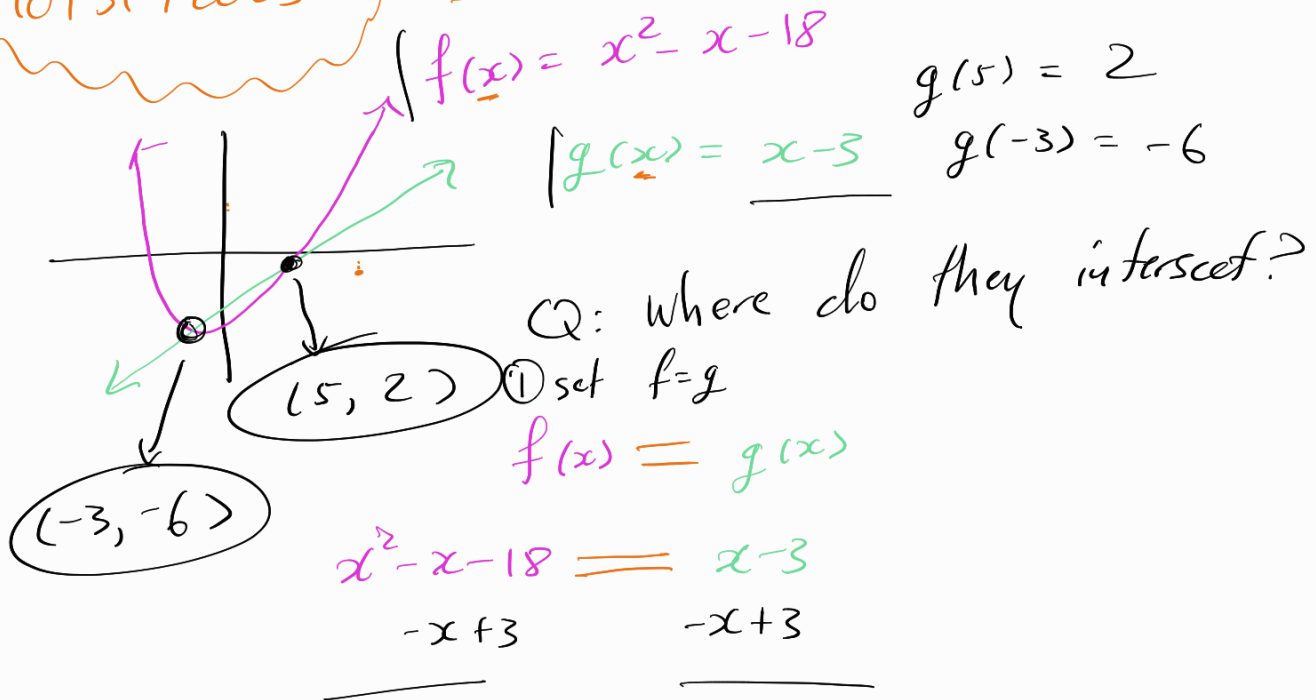


10/31/2023

Points of Intersection



$$x^2 - 2x - 15 = 0$$
$$\hookrightarrow (x-5)(x+3) = 0$$
$$\underline{x = 5, -3}$$

Find the points of intersection
of

$$f(x) = x^2 - 2x + 8$$

$$g(x) = x + 6 \leftarrow$$

STEP 1 set $f = g$

$$x^2 - 2x + 8 = x + 6$$

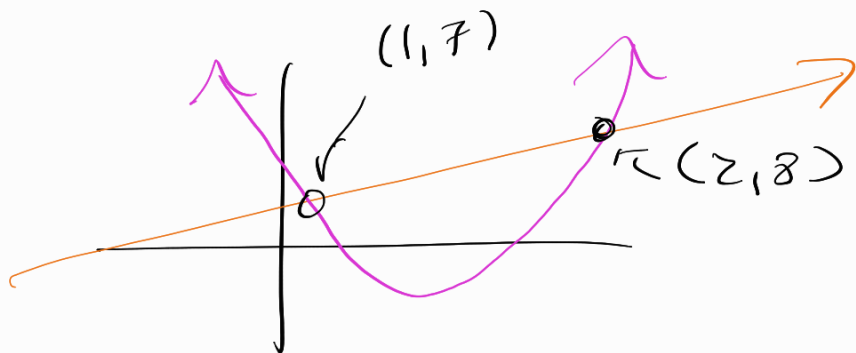
STEP 2 set one side to zero; solve for x !

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

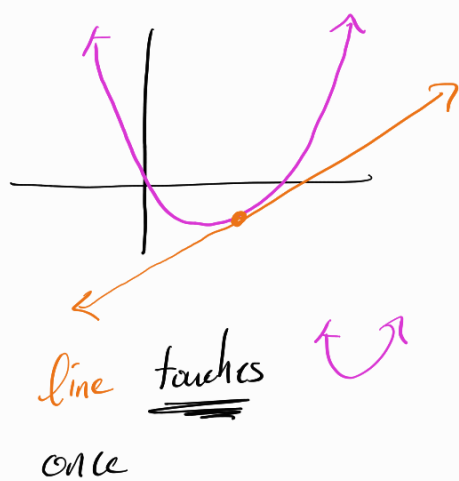
$$(x-2)(x-1) = 0$$

$x = 1$ $x = 2$

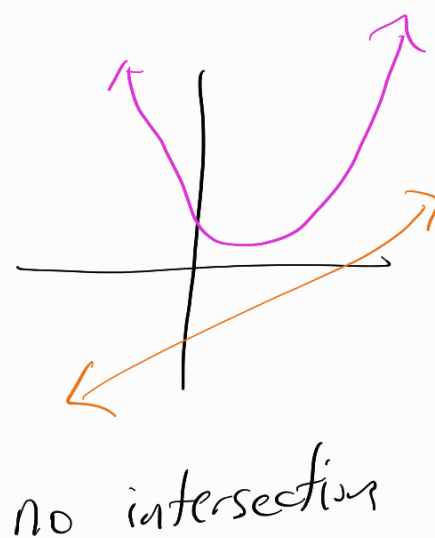
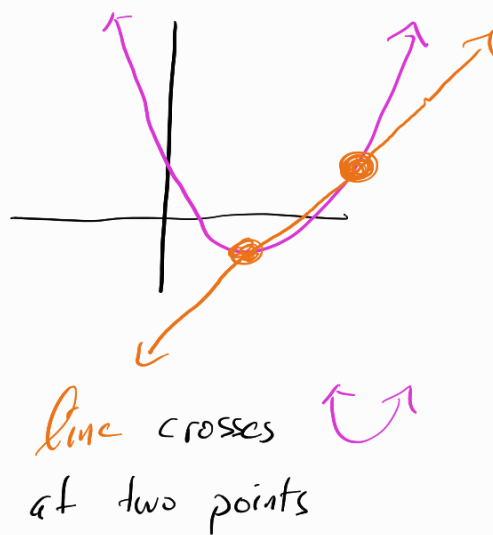
Pts are $(1, 7)$ & $(2, 8)$



Tangent lines



Secant lines



$$f(x) = 2x^2 - 3x + 4$$
$$g(x) = 2x + b$$

Given that $g(x)$ is tangent to $f(x)$

find b .

only one point of intersection!!

$$2x^2 - 3x + 4 = 2x + b$$

$$-2x - 1$$

$$-2x - b$$

$$2x^2 - 5x + (4-b) = 0$$

quadratic!!

$$b^2 - 4ac = 0$$

$$25 - 4(2)(4-b) = 0$$

$$25 - 8(4-b)$$

$$25 - 32 + 8b = 0$$

$$-7 + 8b = 0$$

$$b = 7/8$$

$$f(x) = x^2 - 5x + 7$$

$$g(x) = 3x + k$$

$$b^2 - 4ac$$

f and g are tangent ... find k

(1) Take $f = g$

(2) $b^2 - 4ac = 0 \leftarrow$ look at discriminant

$f - g = 0$
optimal HW due Thurs.

What remains: \wedge this stuff & next essay }
due M