(1) $\lim_{h\to 0} \dfrac{2(x+h)^2-3-(2x^2-3)}{h}$

$\lim_{h\to 0} \dfrac{2(x^2+2xh+h^2)-3-2x^2+3}{h}$

$\lim_{h\to 0} \dfrac{2x^2+4xh+2h^2-3-2x^2+3}{h}$

$\lim_{h\to 0} \dfrac{4xh+2h^2}{h}$

$\lim_{h\to 0} \dfrac{h(4x+2h)}{h}$

$\lim_{h\to 0} 4x+2h = 4x+2(0) = 4x$

(2) $f'(x)=0$ (3) $f'(x)=12x^3+12x^2$

(4) First rewrite $f(x)$ to $f(x)=3x^{-4}-x^{\frac{1}{2}}+7x+12$

$f'(x)=-12x^{-5}-\frac{1}{2}x^{-1/2}+7$

(5) First rewrite $g(x)$ to $g(x)=2x+4x^{-1}$

$g'(x)=2-4x^{-2}$

(6) $g'(x)=10-4x$

$g'(3)=10-4(3)=-2=$ slope

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

$f'(2) = 3(2)^2 - 1 = 11$

So... $m = 11$ $(3, 12)$

$y - 12 = 11(x - 3)$

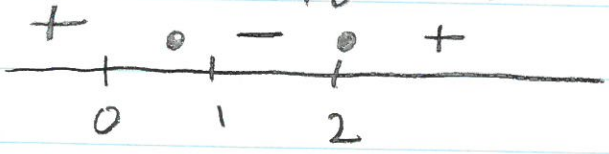
$y - 12 = 11x - 33$

$y = 11x - 21$

(8) $f'(x) = 3x^2 - 8x + 4$

$0 = (3x - 2)(x - 2)$

$\downarrow 2/3 \quad \downarrow 2$



inc: $x < 2/3, x > 2$

dec: $2/3 < x < 2$

max $(2/3, 32/27)$

min $(2, 0)$

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

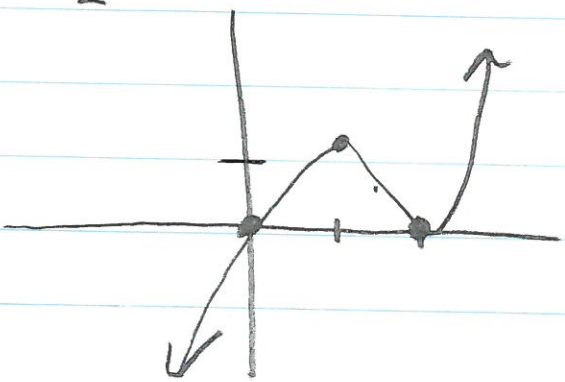
$0 = 2(3x - 4)$

$\downarrow 4/3$

ccu: $x > 4/3$

ccd: $x < 4/3$

poi $(4/3, 16/27)$



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

$0 = 12x^2(x-1)$

0 1

$- \; 0 \; - \; 0 \; +$

0 1

inc: $x > 1$

dec: $x < 1$

min $(1, -1)$

$f''(x) = 36x^2 - 24x$

$0 = 12x(3x-2)$

0 $\frac{2}{3}$

$+ \; 0 \; - \; 0 \; +$

0 1

ccu: $x < 0, \; x > \frac{2}{3}$

ccd: $0 < x < \frac{2}{3}$

POI $(0,0)$

$(\frac{2}{3}, -\frac{16}{27})$