3.2 Review Solutions

1.) $f'(x) = 12x^3 - 12x^2 = 12x^2(x-1) = 0$ C.P. at $x=0$ $x=1$

x	$f(x)$
-1	7
0	0
1	-1
2	16

$f(x)$ has an abs. min @ $(1,-1)$

$f(x)$ has an abs. max @ $(2,16)$

2.) 3

3.) $g'(x) = 3x^2 - 12x = 3x(x-4) = 0$ C.P. at $x=0$ $x=4$

$g(x)$ is inc. on $(-\infty,0) \cup (4,\infty)$ b/c $g'>0$.

4.) a) $f(x)$ is dec. on $(0,3)$ b/c $f'<0$

b) $f(x)$ has a local min @ $x=3$ b/c f' changes from $-$ to $+$.

5.) $f'(x) = 3x^2 - 6x$ $f''(x) = 6x - 6 = 0$ @ $x=1$

$f(x)$ is concave down on $(-\infty,1)$ b/c $f''(x)<0$.

6.)

a.) f is inc. on $(-3,-2)$ b/c $f'>0$

b.) f has a P.O.I. at $x=0$ b/c f' changes from dec. to inc.

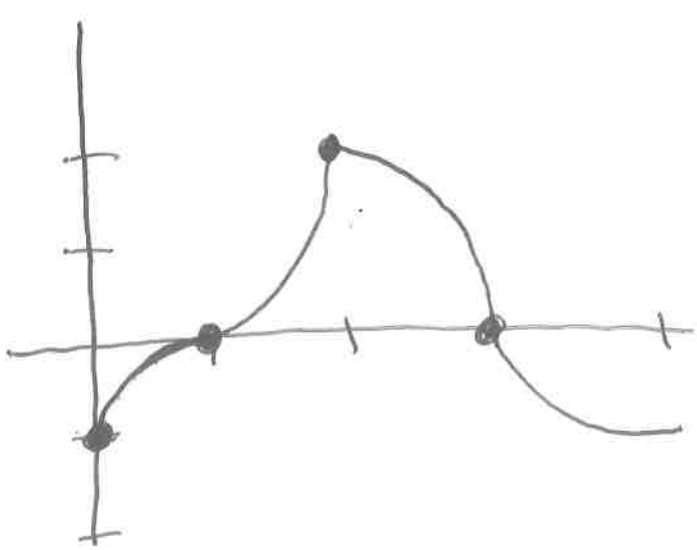
f has a P.O.I. at $x=2$ b/c f' changes from inc to dec.

c.) $y-y_1=\overset{f'(0)}{m}(x-x_1)$ $\quad f'(0)=-2$

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

d.) $f(x)$ has one local max at $x=-2$ b/c $f'(x)$ changes from + to −. This is the only local extrema. $f(x)$ dec. from $(-2,4)$ so $f(x)$ has an abs. max at $x=-2$.

7.)



8.) $f''(3)>0$ so $f(x)$ has a rel. min at 3.

Calc. questions

1.) $F'(7) = -1.87291$

Traffic flow is dec. at $t=7$ b/c

$F'(7) < 0$

2.) $(2,3)$ b/c $f'(x) < 0$ and $f'(x)$ is inc.

Ty Dovie!

3) E

4.) 5 f' changes from dec. to inc.

then inc. to dec. then dec. to inc.

then inc. to dec. then dec. to inc.

Ty Nisreen!