SM 121
LESSON 20 1/3/4/9/10/14/20/36/41

9/24/2008

SECTION 2.8 DERIVATIVE AS A FUNCTION

1) a) $f'(-3) \approx 1.5$

b) $f'(-2) \approx 1$

c) $f'(-1) \approx 0$

d) $f'(0) \approx -4$

e) $f'(1) \approx 0$

f) $f'(2) \approx 1$

g) $f(3) \approx 1.5$

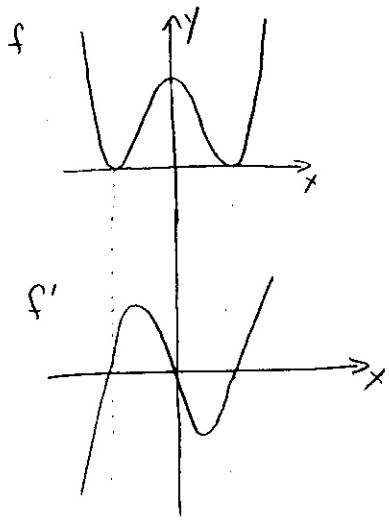
3) a) II

b) IV

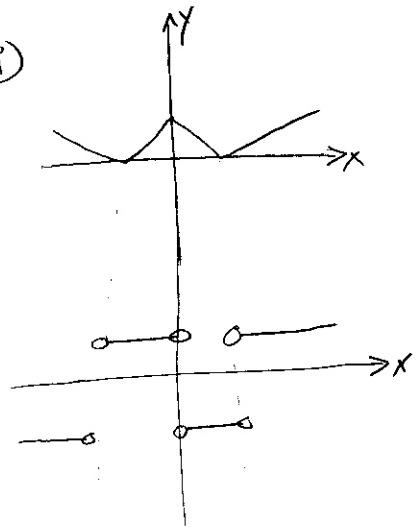
c) I

d) III

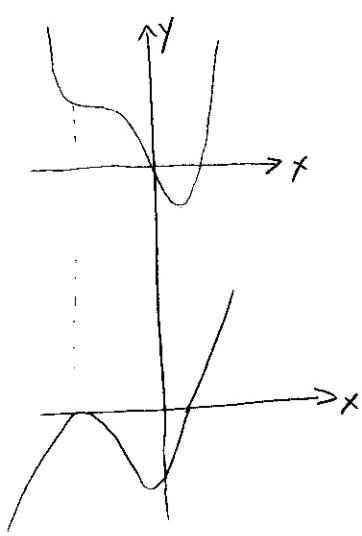
4)



9)



10)



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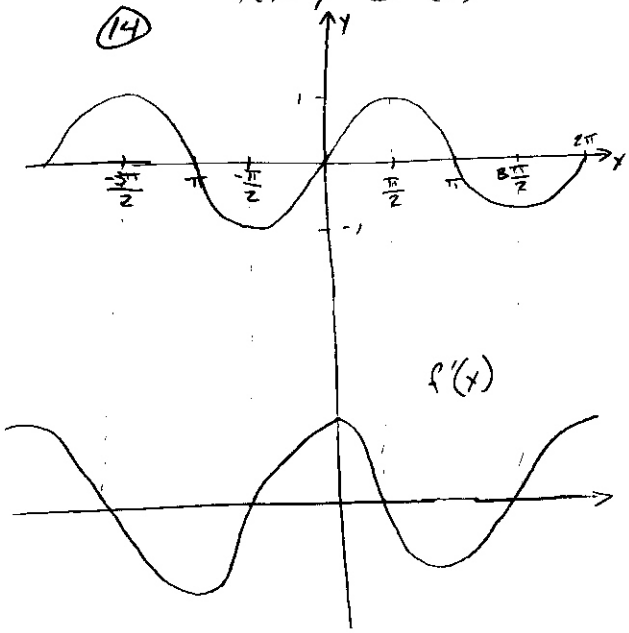
(14) $f(x) = y = \sin(x)$



$\boxed{f'(x) \text{ APPEARS TO BE } \cos x}$

(20) $f(x) = mx + b$

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

$$= \lim_{h \to 0} \frac{m(x+h) + b - (mx+b)}{h}$$

$$= \lim_{h \to 0} \frac{\cancel{mx} + mh \cancel{+b} - \cancel{mx} \cancel{-b}}{h}$$

$$= \lim_{h \to 0} \frac{m\cancel{h}}{\cancel{h}}$$

$\boxed{f'(x) = m \quad \text{DOMAIN OF } f'(x) \ \mathbb{R}}$

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(36) f NOT DIFFERENTIABLE AT $x=0$ BECAUSE THE FUNCTION IS DISCONTINUOUS AT $x=0$.

f IS NOT DIFFERENTIABLE AT $x=3$ BECAUSE THE GRAPH HAS A VERTICAL TANGENT AT $x=3$.

(41) $f(x)$ IS REPRESENTED BY (a)

$f'(x)$ IS REPRESENTED BY (b) BECAUSE WHERE (a) HAS A HORIZONTAL TANGENT $b=0$.

$f''(x)$ IS REPRESENTED BY (c) BECAUSE WHERE (b) HAS A HORIZONTAL TANGENT $c=0$.