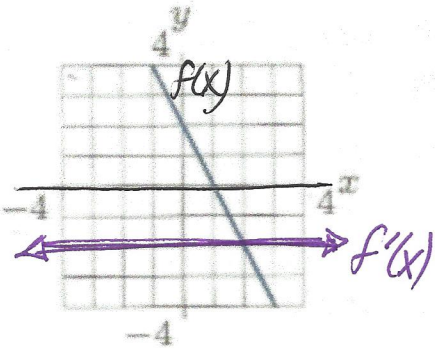


KEY

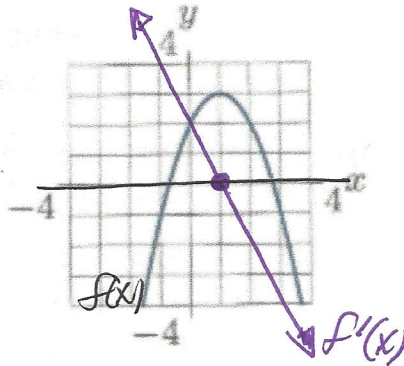
For Exercises 3-12, graph the derivative of the given functions.

Label $f'(x)$ Label $f(x)$

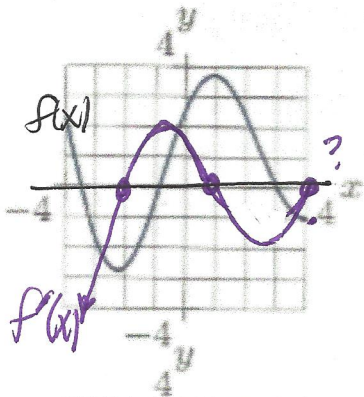
3.



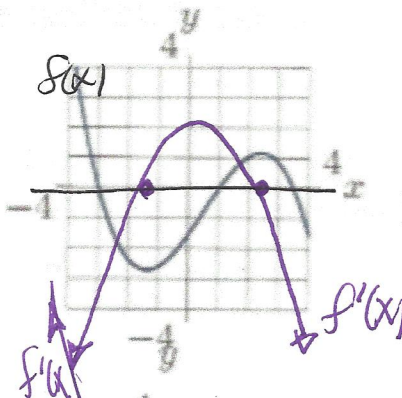
4.



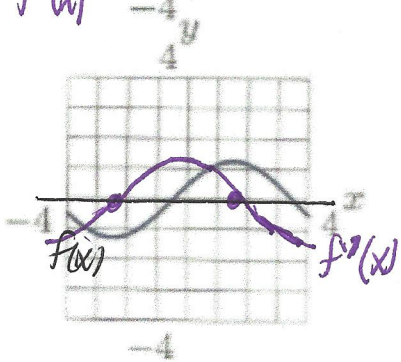
5.



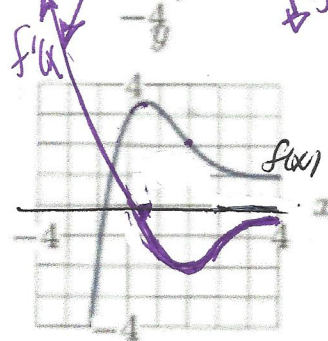
6.



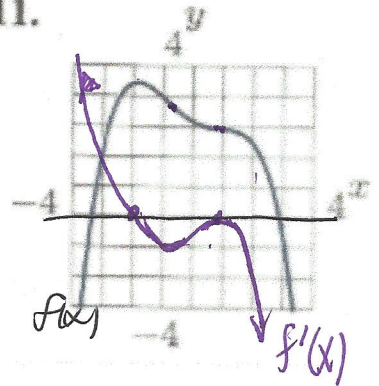
7.



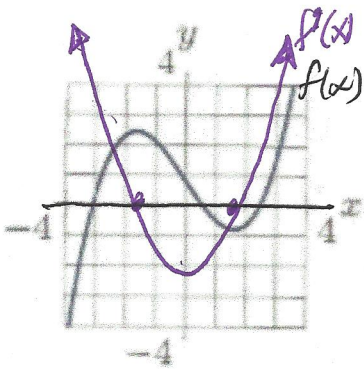
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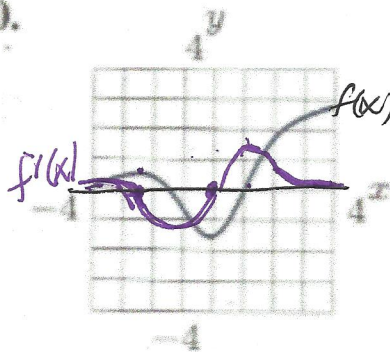
11.



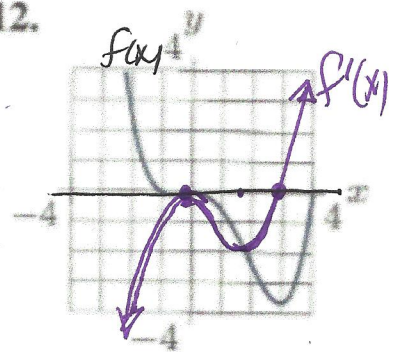
9.



10.



12.



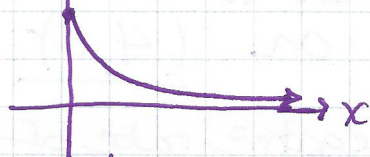
DAY 31

§ 2.3 Derivative Function
pp. 95 (#3-12) #23-28
(see graphs)

(23) a) positive $f(x)$
increasing gradually



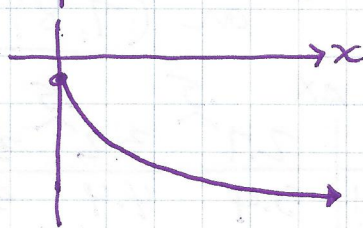
b) positive $f(x)$
decreasing gradually



c) negative $f(x)$
increasing gradually
(becoming less negative)



d) negative $f(x)$
decreasing gradually
(becoming more negative)

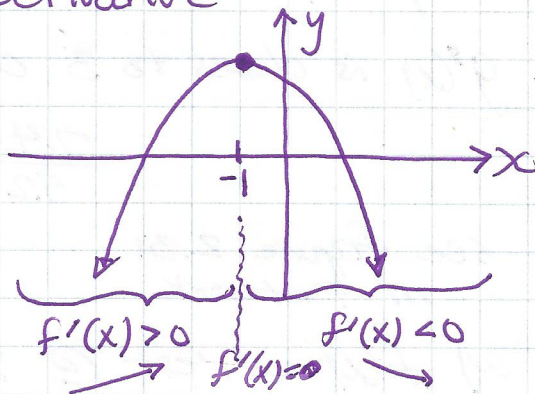


(24) $f(x)$ graph based on derivative

$$f'(x) > 0 \quad x < -1$$

$$f'(x) < 0 \quad x > -1$$

$$f'(x) = 0 \quad x = -1$$



(25) $f(x) = \ln(x)$ ← y_1

don't make a table

Use your calculator

efficiency to get the estimates or find the actual.

ESTIMATES to 4 DECIMAL PLACES

ACTUAL MATH 8
deriv

$$f'(1) = \frac{y_1(1.001) - y_1(.999)}{.002} \approx \underline{1.0000}$$

$$\frac{d}{dx}(y_1) \Big|_{x=1} = \underline{1.0000}$$

$$f'(2) = \frac{y_1(2.001) - y_1(1.999)}{.002} \approx \underline{-0.5000}$$

$$\frac{d}{dx}(y_1) \Big|_{x=2} = \underline{-0.5000}$$

$$f'(5) = \frac{y_1(5.001) - y_1(4.999)}{.002} \approx \underline{0.2000}$$

$$\frac{d}{dx}(y_1) \Big|_{x=5} = \underline{0.2000}$$

$$f'(10) = \frac{y_1(10.001) - y_1(9.999)}{.002} \approx \underline{0.1000}$$

$$\frac{d}{dx}(y_1) \Big|_{x=10} = \underline{0.1000}$$

FIVE STAR
★★★★★

FIVE STAR
★★★★★

FIVE STAR
★★★★★

FIVE STAR
★★★★★

Continued

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DAY 31

26-28

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x	0	1	2	3	4	5	6	7	8
f(x)	18	13	10	9	9	11	15	21	30

\downarrow_{-5} \downarrow_{-3} \downarrow_{-1} \downarrow_0 \downarrow_2 \downarrow_4 \downarrow_6 \downarrow_9

- Where is rate of change of $f(x)$ positive ($f'(x) > 0$)
on (4, 8) b/c $f(x)$ is increasing
- negative rate of change ($f'(x) < 0$)
on (0, 3) b/c $f(x)$ is decreasing
- greatest rate of change
on (7, 8) b/c change in y-values is greatest

27

x	2.7	3.2	3.7	4.2	4.7	5.2	5.7	6.2
g(x)	3.4	4.4	5.0	5.4	6.0	7.4	9.0	11
Δx	.5	.5	.5	.5	.5	.5	.5	
Δy	1	.6	.4	0.6	1.4	1.6	2	

$g'(x)$ is closest to 3 at $x \in$ (4.7, 5.2)

$$\frac{7.4 - 6.0}{5.2 - 4.7} = \frac{1.4}{.5} = 2.8 \leftarrow \text{closest to 3.}$$

28 see figure 2.31 in textbook.

- $f(x)$ greatest @ x3
- $f(x)$ least @ x4
- $f'(x)$ greatest @ x5
(slope)
- $f'(x)$ least @ x3 (only negative slope)