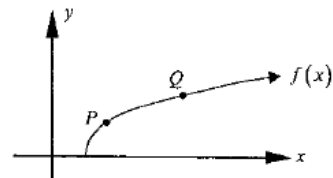


CALCULUS 30: TOPIC 2: OUTCOME 4A REVIEW

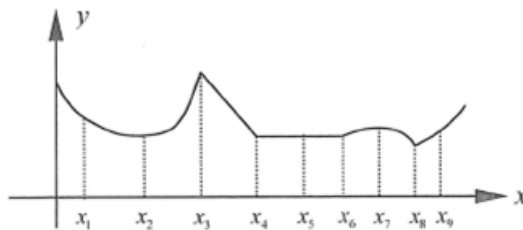
Textbook: P 59 # 8ai, b, c, 9, 10ai, b
P112 # 1, 2, 3, 10

And the following:

- Consider the function $y = f(x)$ shown at right. How does the slope of the tangent line at point P compare in size to the slope of the secant line drawn through P and Q ?



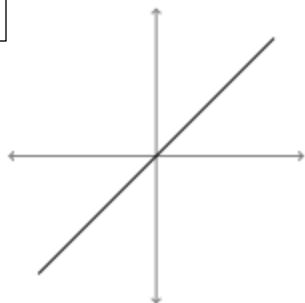
- If $f(x) = 6x - x^2$
 - Find $f'(x)$
 - Find $f'(4)$
- Find $\frac{dy}{dx}$ if $f(x) = \frac{4}{x^2}$
- If $f(x) = \sqrt{x+5}$, find $f'(x)$ and state the domains of f and $f'(x)$.
- Which one of the following does not belong with the others? $f'(x)$, $\frac{f(x+h)-f(x)}{h}$, rate of change of y with respect to x , $\frac{dy}{dx}$, slope of the tangent line.
- Distinguish clearly between the statements $f(2) = 1$ and $f'(1) = 2$.
- Sketch a possible graph of a function $f(x)$ that satisfies all three of the following conditions:
 $f(0) = 3$, $f'(0) = 0$, $f'(x) > 0$ if $x \neq 0$
- Shown below is a function with nine specific x -coordinates indicated. List the x -coordinates of the points at which the derivative does not exist.



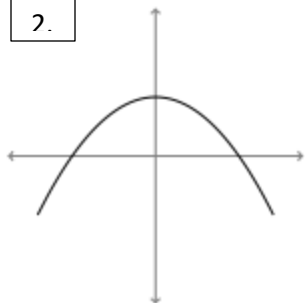
9. Six graphs of functions are below, along with six graphs of derivatives. Match the graph of each function with the graph of its derivative.

Original Functions:

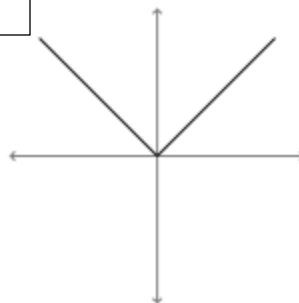
1.



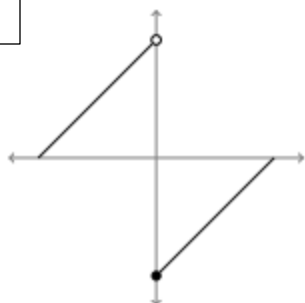
2.



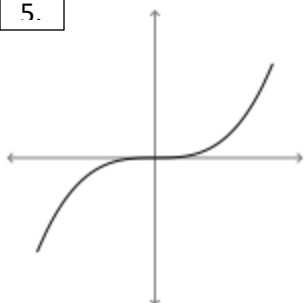
3.



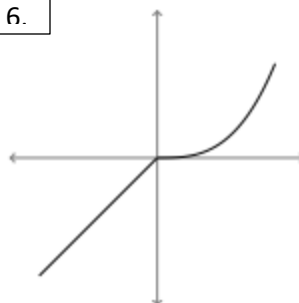
4.



5.

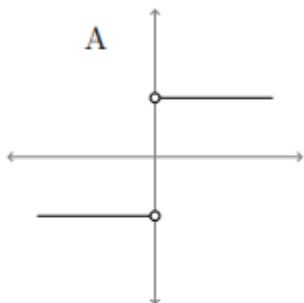


6.

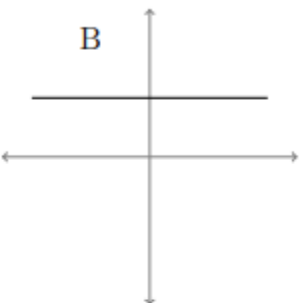


Their derivatives:

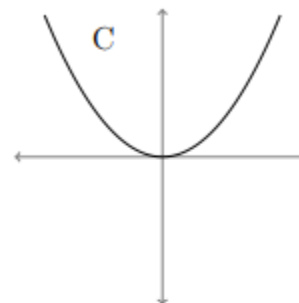
A



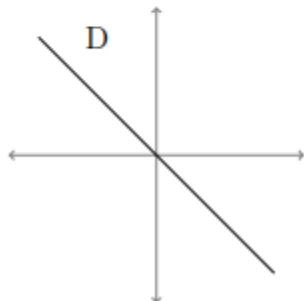
B



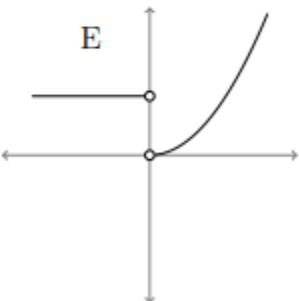
C



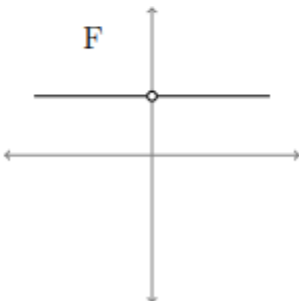
D



E



F



Solutions to Extra Questions on Review:

1. The slope of the tangent line at P is larger than the slope of secant \overline{PQ} .

2. a) $f'(x) = 6 - 2x$

b) $f'(4) = -2$

3. $\frac{dy}{dx} = -\frac{8}{x^3}$

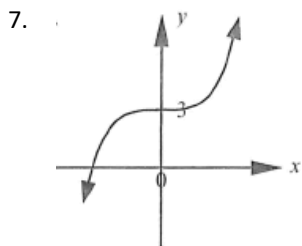
4. $f'(x) = \frac{1}{2\sqrt{x+5}}$, Domain of f : $\{x | x \geq -5, x \in \mathbb{R}\}$, domain of f' : $\{x | x > -5, x \in \mathbb{R}\}$

5. $\frac{f(x+h) - f(x)}{h}$ is the slope of the secant through points P and Q and not the slope of the tangent line as the others are.

(If it had $\lim_{h \rightarrow 0}$ in front it would be the slope of the tangent and would be the same as the others)

6. $f(2) = 1$ tells us that if $x = 2$, $y = 1$. In other words the function passes through the point $(2, 1)$.

$f'(1) = 2$ tells us that at $x = 1$ the slope of the tangent line is 2.



8. x_3, x_4, x_6, x_8

9. #1 = B #2 = D #3 = A #4 = F #5 = C #6 = E