Pre-AP Pre-Cal

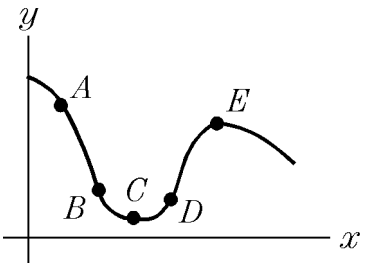
Definintion of the Derivative

Name _____ Date _____

1. At which of the five points shown on the graph is $\frac{dy}{dx}$ positive? Choose the *best* answer.

a) A and E b) D only c) C only

d) C, D, and E e) E only



2. At which of the five points shown on the graph is $\frac{dy}{dx}$ negative? Choose the *best* answer.

a) A and B b) B only c) C only d) C, D, and E e) D only

3. If $f(x) = x^{\frac{1}{3}}$, then which one of the following is equal to $f'(a)$?

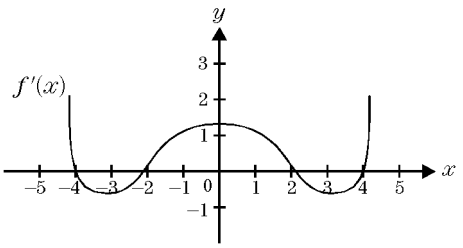
a) $\lim_{a \to 0} \frac{(a+h)^{1/3} - a^{1/3}}{h}$ b) $\lim_{h \to 0} \frac{(\frac{1}{x})^3 - (\frac{1}{a})^3}{h}$ c) $\lim_{h \to 0} \frac{(x+h)^{1/3} - h^{1/3}}{h}$

d) $\lim_{x \to a} x^{1/3}$ e) $\lim_{x \to a} x^{2/3}$

4. The graph $f(x)$ has horizontal tangents when $x =$

a) -3, 0, 3 b) -4, 2 c) -4, -2, 2, 4

d) -4, -2, 4 e) 2, 4



5. If $f(x) = \sqrt{x+2}$, then which one of the following is equal to $f'(x)$?

a) $\lim_{h \to 0} \frac{\sqrt{x+h+2} - \sqrt{x+2}}{2}$ b) $\lim_{h \to 0} \frac{\sqrt{x+h+2} - \sqrt{x+2}}{h}$ c) $\lim_{h \to 0} \frac{\sqrt{x+h+2-(x+2)}}{h}$

d) $\lim_{x \to 2} \frac{\sqrt{x+2} - \sqrt{h+2}}{h}$ e) $\lim_{x \to 2} \frac{\sqrt{x+h+2} - \sqrt{h}}{h}$

6. If $f(x) = \sqrt{x-5}$, then which one of the following is equal to $f'(x)$?

a) $\lim_{h\to 0} \dfrac{\sqrt{x+h-5}-\sqrt{x-5}}{5}$

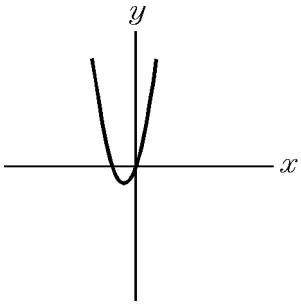
b) $\lim_{h\to 0} \dfrac{\sqrt{x+h-5}-\sqrt{x-5}}{h}$

c) $\lim_{h\to 0} \dfrac{\sqrt{x+h-5-(x-5)}}{h}$

d) $\lim_{x\to 5} \dfrac{\sqrt{x-5}-\sqrt{h-5}}{h}$

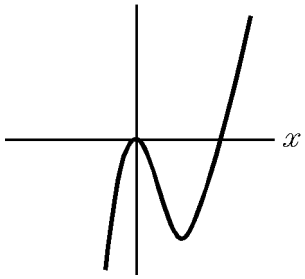
e) $\lim_{x\to 5} \dfrac{\sqrt{x+h-5}-\sqrt{h}}{h}$

7.

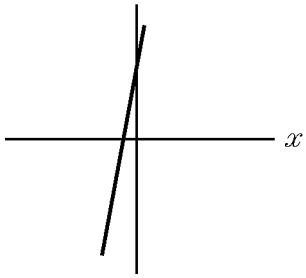


Given the graph of f shown above, which of the following is the graph of the derivative, f'?

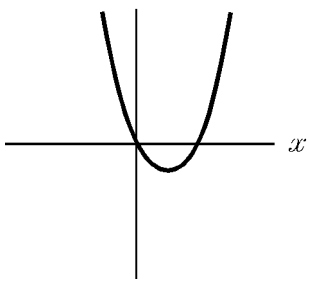
a)



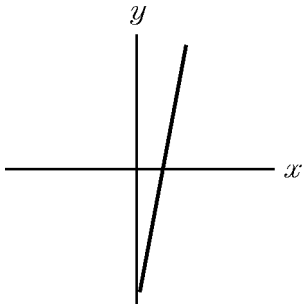
b)



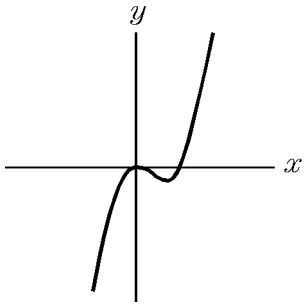
c)



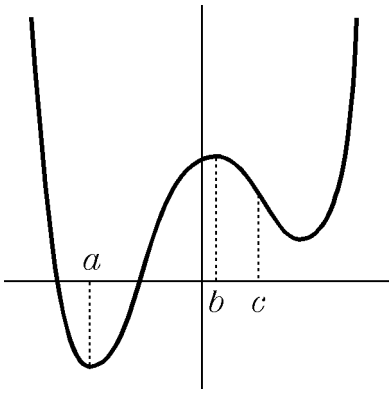
d)



e)



8.



Which of the following tables best goes with the graph of f shown?

a)

x	$f'(x)$
a	0
b	0
c	4

b)

x	$f'(x)$
a	0
b	0
c	-2

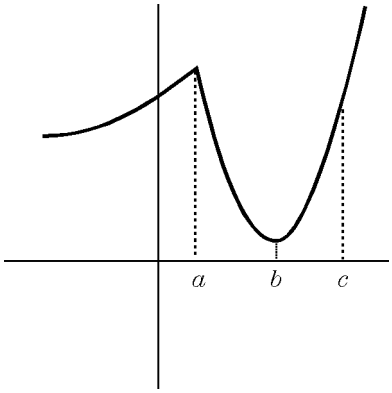
c)

x	$f'(x)$
a	does not exist
b	0
c	6.2

d)

x	$f'(x)$
a	does not exist
b	does not exist
c	-1

9.



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d)

x	$f'(x)$
a	does not exist
b	does not exist
c	-1

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

a) $6xh$ b) 6 c) $6x$ d) $3x$ e) 3

11. What is $\lim_{h\to 0} \dfrac{(x+h)^3 - x^3}{h}$?

a) $3x^2h + 3x$ b) $3x^2$ c) $6xh$ d) h^2 e) 0

12. What is $\lim_{h\to 0} \dfrac{\sqrt{2(x+h)} - \sqrt{2x}}{h}$?

a) $\dfrac{1}{\sqrt{2x}}$ b) $\dfrac{1}{2\sqrt{2x}}$ c) $\sqrt{2x}$ d) $2\sqrt{2x}$ e) 0

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Answer List

1.	b	2.	a	3.	a
4.	c	5.	b	6.	b
7.	b	8.	b	9.	c
10.	c	11.	b	12.	a

Catalog List

1.	APC DD 3	2.	APC DD 4	3.	APC DA 7
4.	APC EC 1	5.	APC DA 3	6.	APC DA 4
7.	APC DD 10	8.	APC DD 16	9.	APC DD 17
10.	APC CB 1	11.	APC DA 2	12.	APC DA 6