Pre-AP Pre-Cal

Derivative Quiz Review

Name _____ Date _____

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

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

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

2. What is $\lim_{h\to 0} \frac{\sqrt{9+h} - \sqrt{9}}{h}$?

a) $\frac{1}{18}$ b) $\frac{1}{6}$ c) 6

d) 18 e) $\frac{1}{2\sqrt{9+h}}$

3. $\lim_{h\to 0} \frac{\frac{1}{x+h} - \frac{1}{x}}{h} =$

a) $\frac{1}{x^2}$ b) $-x^2$ c) $-\frac{1}{x^2}$ d) x^2 e) $-\frac{1}{x}$

4. 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) $\lim_{x\to 2} \frac{\sqrt{x+h+2} - \sqrt{h}}{h}$

5. $\lim_{h\to 0} \frac{(x+h)^4 - x^4}{h} =$

a) $4x$ b) $3x^4$ c) $4x^3$ d) $3x^3$ e) x^3

6. A function f is given by the table shown.

Estimate $f'(5.5)$:

x	3.7	4.3	4.9	5.5	6.1
$f(x)$	1.8	3.4	4.6	6.4	8.4

a) 0.316 b) 3.167 c) 0.300

d) 6.400 e) 0.297

7. The table shows the position of an object moving along a line at 10 second intervals.

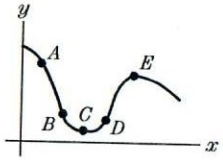
Estimate the velocity, in units/sec, at $t = 35$.

$t(sec)$	0	10	20	30	40
position	4	12	26	44	68

a) 0.417 b) 2.400 c) −2.400

d) 11.200 e) 3.842

8. 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

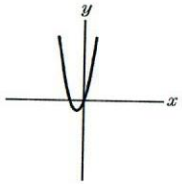
9. At which of the five points shown on the graph is $\frac{dy}{dx}$ negative? Choose the *best* answer.

a) A and B b) B only

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

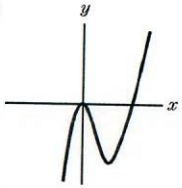
e) D only

10.

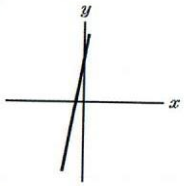


Given the graph of f shown above, which of the following is the graph of the derivative, f'?

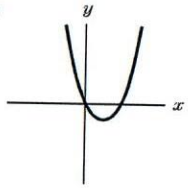
a)



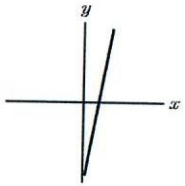
b)



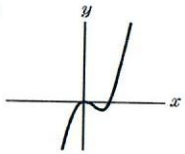
c)



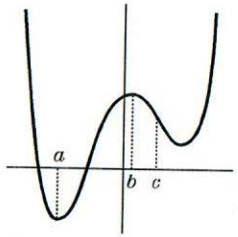
d)



e)



11.



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

12. What is the average rate of change over $2 \le t \le 4$?

t	2	3	4	5	6
$f(t)$	1.8	3.4	4.6	6.4	8.4

a) 2.8 b) 1.4 c) −2.8

d) −1.4 e) 0.714

13. What is the average rate of change over $4 \le t \le 6$?

t	2	3	4	5	6
$f(t)$	1.8	3.4	4.6	6.4	8.4

a) 3.8 b) 1.9 c) −3.8
d) −1.9 e) 0.526

14. The position of an object is given by $s = t^2 + 5t - 20$. What is its average velocity for $1 \le t \le 3$?

a) −5 b) 5 c) 9 d) −9 e) 6

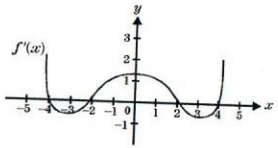
15. The position of an object is given by $s = t^2 - 4t + 7$. What is its average velocity over $[t, t + \Delta t]$?

a) $t^2 - 4 + \Delta t$
b) $t^2 - 4t + \Delta t$
c) $2t - 4 + \Delta t$
d) $2t + \Delta t$
e) not enough information

16. Given the position function $s = t^3 + 5t - 1$, what is the instantaneous rate of change at $t = 2$?

a) $3t^2 + 5$ b) $3t^2$ c) 12
d) 17 e) 16

17. 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

- Be careful if the graph given is f(x) or f'(x).
- Average rate of change → slope
- Instantaneous → derivative
- If x is in the denominator, the exponent is negative.
- KNOW THE LIMIT DEFINITION
  → you will have to find a derivative by hand w/out using the power rule

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Answer List

1. a	2. b	3. c
4. b	5. c	6. b
7. b	8. b	9. a
10. b	11. b	12. b
13. b	14. c	15. c
16. d	17. c	

Catalog List

1. APC DA 7	2. APC DA 17	3. APC CB 13
4. APC DA 3	5. APC CB 10	6. APC DC 2
7. APC DC 12	8. APC DD 3	9. APC DD 4
10. APC DD 10	11. APC DD 16	12. APC DI 1
13. APC DI 2	14. APC DI 9	15. APC DI 11
16. APC DI 17	17. APC EC 1	

Review
14.1–14.4 assignments