Problems for Gateway #2: The Limit Definition of the Derivative

1. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.001	0.0001
Difference Quotient	−1	−1	−1	−1

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 2 **(b)** 0.0001

(c) 1 **(d)** −1

(e) None of the above.

2. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.0001	0.000001
Difference Quotient	−1	2	2.13	2.1334

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 0.000001 **(b)** 4

(c) 2.1334 **(d)** −1

(e) −0.000001

3. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.0001	0.000001
Difference Quotient	2	0.02	0.0002	0.000002

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 0.02 **(b)** 0.0001

(c) 2 **(d)** 0.000002

(e) 0

4. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.0001	0.000001
Difference Quotient	4	2.7822	2.7726	2.77268

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 2.7726 **(b)** 4

(c) 2.7822 **(d)** 2.77268

(e) None of the above.

5. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.000000001	0.0001
Difference Quotient	4	2.7822	2.7726	2.77268

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 2.7726 **(b)** 4

(c) 2.7822 **(d)** 2.77268

(e) None of the above.

6. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.001	0.0001
Difference Quotient	4	0.004	0.00004	0.0000004

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 0 **(b)** 4

(c) 0.0000004 **(d)** 0.001

(e) None of the above.

7. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.001	0.0001
Difference Quotient	2	1.01	1.001	1.0001

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 1.0001
(b) 1
(c) 2
(d) 0.01
(e) 1.001

8. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.001	0.0001
Difference Quotient	4	0.4	0.04	0.004

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 0.0004
(b) 4
(c) 0.0001
(d) 1
(e) 0

9. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.001	0.0001
Difference Quotient	1.8	1.801	1.8001	1.80001

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 1
(b) 1.80001
(c) 0.01
(d) 1.8
(e) None of the above.

10. The table below shows the difference quotient for a function *f* evaluated at $x = 2$.

h	1	0.01	0.001	0.0001
Difference Quotient	0	0	0	0

Which of the following best approximates the value of the derivative $f'(2)$?

(a) 0.0001
(b) 1
(c) 0.001
(d) 2
(e) 0

ANSWERS:

1.	D	**2.**	C	**3.**	E	**4.**	D
5.	A	**6.**	A	**7.**	B	**8.**	E
9.	D	**10.**	E				