Quiz 1

---

1. Solve for x in the inequality $|3 - 2x| > 5$.

→*A*. $\{x \mid x > 4 \text{ or } x < -1\}$
B. $(-1, 4)$
C. $(-\infty, -4) \cup (1, \infty)$
D. All of the above.
E. None of the above.

---

2. What is an equation of the line thru the point $(-1, 6)$ and parallel to the line $x + 2y = 6$?

A. $x + 2y = 11$
B. $y = \frac{11}{2} - \frac{1}{2}x$
C. $x = 11 - 2y$
→*D*. All of the above.
E. None of the above.

---

3. What is the point on the y-axis that is equidistant from the points $(-5, 5)$ and $(1, 1)$?

A. $(3, 0)$
B. $(-2, 3)$
C. $(0, 3)$
D. All of the above.
→*E*. None of the above.

---

4. The graph of the equation $(x + 3)^2 + (y - 1)^2 = 4$ is

A. the circle of radius 2 and center $(3, -1)$.
→*B*. the circle of radius 2 and center $(-3, 1)$.
C. the circle of radius 4 and center $(3, -1)$.
D. All of the above.
E. None of the above.

---

5. The graph of the equation $x + y^2 = 4$ is

A. a parabola opening to the right.
→*B*. a parabola opening to the left.
C. a parabola opening down.
D. a parabola opening up.
E. None of the above.
E. None of the above.

Quiz 2

---

1. What is an equation for the family of all linear functions f such that $f(3) = 2$?

A. $f(x) = m(x-2)+3$.
B. $f(x) = 3x+2$.
C. $f(x) = 3mx+2b$.
→*D.* None of the above.

---

2. If $g(x) = \sqrt{5-x}$ then

A. the domain of g is $(-\infty, 5]$.
B. the range of g is $[0, +\infty)$.
C. the graph of g is half of a parabola.
→*D.* All of the above.
E. None of the above.

---

3. If $f(x) = x^2 - x$ then $\dfrac{f(x+h)-f(x)}{h} =$

A. $h-1$.
→*B.* $2x+1-h$
C. $2x-1+h$.
D. None of the above.

---

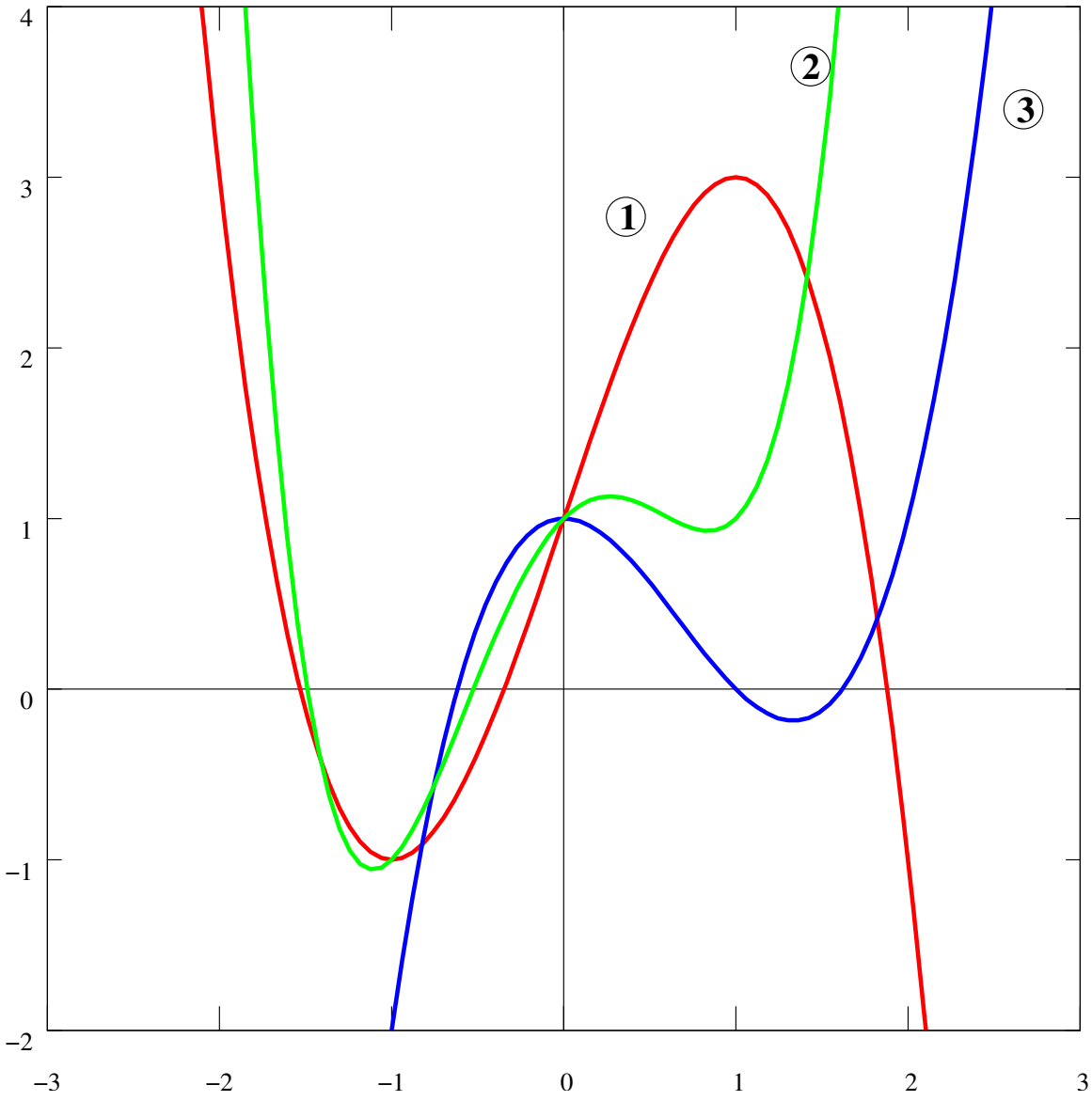
4. In the graph on the next page, what is the equation for the graph labeled **2**?

A. $y = 1+3x-x^3$.
B. $y = x^3-2x^2+1$.
→*C.* $y = x^4-2x^2+x+1$.
D. None of the above.

---

5. In the graph on the next page, which is the graph of the function $f(x) = 1+3x-x^3$?

→*A.* **1**.
B. **2**.
C. **3**.
D. None of the above.


4
3
2
1
0
−1
−2
−3
−2
−1
0
1
2
3
1
2
3

Quiz 3

---

1. What is an equation for the family of all linear functions f such that $f(1) = 5$?

→*A*. $f(x) = m(x-1)+5$.
B. $f(x) = m(x-5)+1$.
C. $f(x) = m(x+1)-5$.
D. None of the above.

---

2. If $g(x) = 3 + |5 - x|$ then

A. the domain of g is $(-\infty, 5]$.
B. the range of g is $[0, +\infty)$.
C. the graph of g is a parabola.
D. All of the above.
→*E*. None of the above.

---

3. If $f(x) = x^2 + 3$ then $\dfrac{f(x+h) - f(x)}{h} =$

A. $h + 3$.
B. $2x - h$
→*C*. $2x + h$.
D. None of the above.

---

4. In the graph on the previous page, what is the equation for the graph labeled **3**?

A. $y = 1 + 3x - x^3$.
→*B*. $y = x^3 - 2x^2 + 1$.
C. $y = x^4 - 2x^2 + x + 1$.
D. None of the above.

---

5. In the graph on the previous page, which is the graph of the function $f(x) = x^4 - 2x^2 + x + 1$.

A. **1**.
→*B*. **2**.
C. **3**.
D. None of the above.

Quiz 4

---

1. If $f(x) = 1/x$ then $\dfrac{f(x+h) - f(x)}{h} =$

→*A*. $-\dfrac{1}{(x+h)x}$.
B. $-\dfrac{1}{h}$.
C. $\dfrac{1}{h(x+h)x}$.
D. None of the above.

---

2. $\lim\limits_{n\to\infty} \dfrac{n^3 - 2n^2 + 1}{5n^3 + n + 4} =$

→*A*. 1/5.
B. 1/4.
C. 0.
D. None of the above.

---

3. $\lim\limits_{n\to\infty} \dfrac{(-3)^n}{5^{n+1}} =$

A. −3/5.
→*B*. 0.
C. $-\infty$.
D. None of the above.

---

4. $\lim\limits_{n\to\infty} \dfrac{1}{n!} =$

A. $1/n$.
B. $1/n!$.
C. $+\infty$.
→*D*. None of the above.

---

5. $\lim\limits_{n\to\infty} \sin(n) =$

A. 1.
B. −1.
C. 0.
→*D*. None of the above.

Quiz 5

---

1. $\lim_{x \to 2} \dfrac{x^2 - 5x + 6}{x - 2} =$

A. 1.
B. 0.
→*C*. -1.
D. None of the above.

---

2. $\lim_{x \to 3} \dfrac{x^2 - 5x + 6}{x - 3} =$

→*A*. 1.
B. 0.
C. -1.
D. None of the above.

---

3. $\lim_{x \to 0} \dfrac{|x|}{x} =$

A. 1.
B. 0.
C. -1.
→*D*. None of the above.

---

4. Given that $f(x) = 3x + 1$, what value of δ ensures that $|f(x) - 4| < 0.1$ whenever $|x - 1| < \delta$?

A. $\delta = 0.1$.
B. $\delta = 0.2$.
C. $\delta = 0.3$.
D. All of the above.
→*E*. None of the above.

---

5. Given that $f(x) = x/3$, what value of δ ensures that $|f(x) - 1| < 0.1$ whenever $|x - 3| < \delta$?

A. $\delta = 0.1$.
B. $\delta = 0.2$.
C. $\delta = 0.3$.
→*D*. All of the above.
E. None of the above.

Quiz 6

---

1. The graph of the equation $x - y^2 = 3 - y$ is

→*A*. a parabola opening to the right.
B. a parabola opening to the left.
C. a parabola opening up.
D. a parabola opening down.
E. None of the above.

---

2. What is an equation for the family of all linear functions f such that $f(3) = 2$?

→*A*. $f(x) = m(x - 3) + 2$.
B. $f(x) = 3x + 2$.
C. $f(x) = 3mx + 2b$.
D. None of the above.

---

3. If $f(x) = x - x^2$ then $\dfrac{f(x+h) - f(x)}{h} =$

A. $1 + 2x + h$.
B. $1 + 2x - h$
C. $1 - 2x + h$.
→*D*. $1 - 2x - h$.
E. None of the above.

---

4. $\lim\limits_{x \to 3} \dfrac{x^2 - 9}{x^2 - x - 6} =$

A. 9/6.
B. 1.
C. ∞.
→*D*. None of the above.

---

5. $\lim\limits_{x \to -2} \dfrac{x^2 - 9}{x^2 - x - 6} =$

A. 9/6.
B. 1.
→*C*. ∞.
D. None of the above.

Quiz 7

---

1. Let $f(x) = \begin{cases} 1 - x^2, & \text{if } x < -2; \\ x - 1, & \text{if } -2 \leq x < 1; \\ x^2, & \text{if } 1 \leq x. \end{cases}$ Where is f *dis*continuous?

A. -2
→B. 1
C. Both.
D. Nowhere.

---

2. Let $f(x) = \begin{cases} 3 - x, & \text{if } x < 0; \\ x^2, & \text{if } 0 \leq x < 3; \\ 2x + 3, & \text{if } 3 \leq x. \end{cases}$ Where is f *dis*continuous?

→A. 0
B. 3
C. Both.
D. Nowhere.

---

3. What is an equation of the tangent line to the curve $y = x - x^2$ at the point $(1, 0)$?

A. $y = -x$
→B. $y = -(x - 1)$
C. $y = x + 1$.
D. None of the above.

---

4. What is an equation of the tangent line to the curve $y = \sqrt{x}$ at the point $(4, 2)$?

→A. $y - 2 = \frac{1}{4}(x - 4)$
B. $y - 2 = \frac{1}{2}(x - 4)$
C. $y - 4 = \frac{1}{4}(x - 2)$
D. None of the above.

---

5. If an object's position is given by the formula $s = 3t^2 + 2t$ then its velocity at time $t = 2$ is

A. 10
B. 12
→C. 14
D. None of the above.

Quiz 8

---

1. Let $f(x) = \begin{cases} 3+x, & \text{if } x < -2; \\ (x+1)^2, & \text{if } -2 \le x < 0; \\ \sqrt{x}+1, & \text{if } 0 \le x. \end{cases}$ Where is f *dis*continuous?

A. -2
B. 0
C. Both.
→*D*. Nowhere.

---

2. Let $f(x) = \begin{cases} 3/(x-1), & \text{if } x < 0; \\ 2x-3, & \text{if } 0 \le x. \end{cases}$ Where is f *dis*continuous?

A. 0
B. 1
C. Both.
→*D*. Nowhere.

---

3. What is an equation of the tangent line to the curve $y = 4 - 3x^2$ at the point $(1, 1)$?

A. $y - 1 = -2(x-1)$
B. $y - 1 = -3(x-1)$
→*C*. $y - 1 = -6(x-1)$.
D. None of the above.

---

4. What is an equation of the tangent line to the curve $y = \sqrt{x-2}$ at the point $(3, 1)$?

A. $y - 3 = \frac{1}{2}(x-1)$
→*B*. $y - 1 = \frac{1}{2}(x-3)$
C. $y - 1 = \frac{1}{3}(x-3)$
D. None of the above.

---

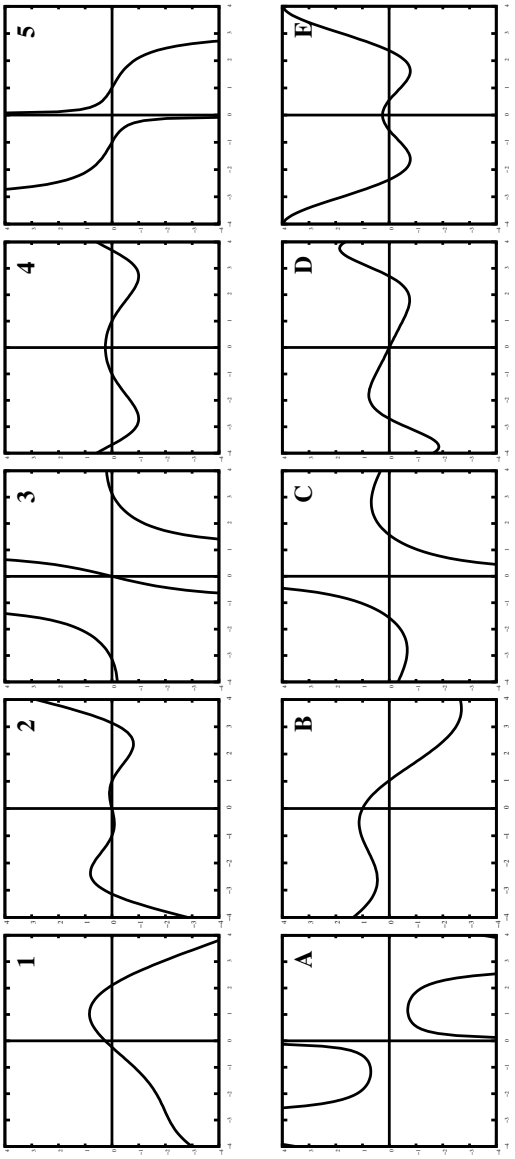
5. If an object's position is given by the formula $s = 3 + 2t - t^3$ then its velocity at time $t = 1$ is

A. 2
B. 0
→*C*. -1
D. None of the above.

Quiz 9

Match the graphs of the functions **1–5** with those of their derivatives **A-E**. Use **F** for "None of these".

1: B; 2: E; 3: F; 4: D; 5: F.



Quiz 10

---

1. True or false: If p is a polynomial then $\lim_{t \to 9} p(t) = p(9)$.

True.

---

2. True or false: If f is continuous on $[-1, 1]$ and if $f(-1) = 2$ and $f(1) = 0$ then there is a value t in the interval such that $f(t) = \sqrt{2}$.

True.

---

3. If $f(x) = (x^7 + 2x^3 - 5x^2 + 9)(3x^8 - x^7 + 8x^4 - 3x^2 + 6x)$ then $df/dx =$

A. $(7x^6 + 6x^2 - 10x)(24x^7 - 7x^6 + 32x^3 - 6x + 6)$.
B. $(7x^6 + 6x^2 - 10x) + (24x^7 - 7x^6 + 32x^3 - 6x + 6)$.
C. $(7x^6 + 6x^2 - 10x) \circ (24x^7 - 7x^6 + 32x^3 - 6x + 6)$.
D. All of the above.
→*E.* None of the above.

---

4. If $f(x) = 7\sqrt{\pi + 1}$ then $df/dx =$

A. $\frac{7}{2}/\sqrt{\pi + 1}$.
B. $7 \cdot (2\sqrt{\pi + 1})^{-1}$.
C. $\frac{7}{2} \cdot (\pi + 1)^{-1/2}$.
D. All of the above.
→*E.* None of the above.

---

5. If $f(x) = \sqrt{x}/(x + 1)$ then $df/dx =$

→*A.* $(\frac{1}{2}x^{-1/2} \cdot (x + 1) - x^{1/2})/(x + 1)^2$.
B. $(\frac{1}{2}x^{-1/2} \cdot (x + 1) + x^{1/2})/(x + 1)^2$.
C. $(-\frac{1}{2}x^{-1/2} \cdot (x + 1) + x^{1/2})/(x + 1)^2$.
D. All of the above.
E. None of the above.

Quiz 11

---

1. True or false: If p and q are polynomials then $\lim_{t \to 9} (p(t)/q(t)) = p(9)/q(9)$.
False.

---

2. True or false: If $f(-1) = 1$ and $f(1) = 4$ then there is a value t in the interval such that $f(t) = \pi$.
False.

---

3. True or false: If f is continuous at a point a then f is differentiable at a.
False.

---

4. If $f(x) = 7\sqrt{x+1}$ then $df/dx =$
A. $\frac{7}{2}/\sqrt{x+1}$.
B. $7 \cdot (2\sqrt{x+1})^{-1}$.
C. $\frac{7}{2} \cdot (x+1)^{-1/2}$.
$\rightarrow D$. All of the above.
E. None of the above.

---

5. If $f(x) = (3x^9 - 2x^5 + 4x^2 + 8)^{11}$ then $df/dx =$
A. $11(3x^9 - 2x^5 + 4x^2 + 8)^{10}$.
B. $11(27x^8 - 10x^4 + 8x)^{10}$.
$\rightarrow C$. $11(3x^9 - 2x^5 + 4x^2 + 8)^{10}(27x^8 - 10x^4 + 8x)$.
D. All of the above.
E. None of the above.

Quiz 12

---

1. If $f(x) = x\,\sin(x)$ then $df/dx =$
- $A.$ $x + \cos(x)$.
- $\rightarrow B.$ $x\,\cos(x) + \sin(x)$.
- $C.$ $x\,\cos(x) + 1$.
- $D.$ None of the above.

---

2. If $g(t) = \sqrt{\sin(t)}$ then $dg/dt =$
- $\rightarrow A.$ $\frac{1}{2}\cos(t)/\sqrt{\sin(t)}$.
- $B.$ $\frac{1}{2}/\sqrt{\cos(t)}$.
- $C.$ $\frac{1}{2}\sin(t)/\sqrt{\cos(t)}$.
- $D.$ None of the above.

---

3. If $H(x) = \tan(x)$ then $dH/dx =$
- $\rightarrow A.$ $1/\cos^2(x)$.
- $B.$ $\sin(x)/\cos^2(x)$.
- $C.$ $-\sin(x)/\cos^2(x)$.
- $D.$ None of the above.

---

4. If $Q(y) = \sec(y)$ then $dQ/dy =$
- $A.$ $1/\cos^2(y)$.
- $\rightarrow B.$ $\sin(y)/\cos^2(y)$.
- $C.$ $-\sin(y)/\cos^2(y)$.
- $D.$ None of the above.

---

5. If $y(t) = \sin^2(t) + \cos^2(t)$ then $dy/dt =$
- $A.$ $2\sin(t)\cos(t)$.
- $B.$ $\cos^2(t) - \sin^2(t)$.
- $\rightarrow C.$ 0.
- $D.$ None of the above.

Quiz 13

---

1. $\lim_{t\to 0} \dfrac{\sin(3t)}{2t} =$

A. 1.
→*B*. 3/2.
C. 2/3.
D. None of the above.

---

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

A. $\sin(x)$.
→*B*. $\cos(x)$.
C. 1.
D. None of the above.

---

3. $\lim_{\theta\to 0^+} \sqrt{\cos(3\theta)} =$

→*A*. 1.
B. 3.
C. $\sqrt{3}$.
D. None of the above.

---

4. $\lim_{x\to 0} \dfrac{x}{\tan(x)} =$

→*A*. 1.
B. 0.
C. ∞.
D. None of the above.

---

5. $\lim_{u\to 0} \dfrac{\sin(u)}{\tan(u)} =$

→*A*. 1.
B. 0.
C. ∞.
D. None of the above.

Quiz 14

---

1. $\lim_{t\to 0} \dfrac{\tan(2t)}{\sin(3t)} =$

A. 1.
→*B*. 2/3.
C. ∞
D. 0.
E. None of the above.

---

2. $\lim_{t\to 0} \dfrac{\tan(2t)}{\cos(3t)} =$

A. 1.
B. 2/3.
C. ∞
→*D*. 0.
E. None of the above.

---

3. If $f(x) = 3x^2 - 2$ then its tangent line at $(1, 1)$ has equation
→*A*. $y - 1 = 6(x - 1)$.
B. $y = 6x$.
C. $y - 1 = x + 6$.
D. None of the above.

---

4. If $f(x) = 3x^2 - 2$ then the linear approximation to $f(1 + \Delta x)$ is $L(\Delta x) =$
A. $6\Delta x$.
B. $\Delta x + 6$.
→*C*. $6\Delta x + 1$.
D. None of the above.

---

5. If $g(z) = 1/\sqrt{1 + z^2}$ then $dg/dz =$
A. $-\frac{1}{2}(1 + z^2)^{-3/2}$.
→*B*. $-z/(1 + z^2)^{3/2}$.
C. $\frac{1}{2}/\sqrt{1 + z^2}$.
D. None of the above.

Quiz 15

---

1. If $y = \tan(t - t^3)$ then $dy/dt =$
A. $\sec^2(1 - 3t^2)$.
B. $\sec^2(1 - 3t^2) \cdot (1 - 3t^2)$.
→*C.* $\sec^2(t - t^3) \cdot (1 - 3t^2)$.
D. None of the above.

---

2. If $f(x) = \sqrt{1 + \sqrt{1 + x^2}}$ then $df/dx =$
A. $\frac{1}{2}(1 + \sqrt{1 + x^2})^{-1/2} \cdot \frac{1}{2}(1 + x^2)^{-1/2}$.
B. $\frac{1}{2}(1 + \sqrt{1 + x^2})^{-1/2} \cdot 2x$.
C. $\frac{1}{2}(1 + \sqrt{1 + x^2})^{-1/2} \cdot \frac{1}{2}(2x)^{-1/2}$.
→*D.* None of the above.

---

3. If $f(x) = \sqrt{x}$ then the linear approximation to $f(4 + \Delta x)$ is $L(\Delta x) =$
A. Δx.
B. $\frac{1}{2}\Delta x + 2$.
C. $\frac{1}{4}\Delta x + 4$.
→*D.* None of the above.

---

4. If $f(x) = \sin(x)$ then the linear approximation to $f(\frac{\pi}{2} + \Delta x)$ is $L(\Delta x) =$
A. 0.
→*B.* 1.
C. $\frac{\pi}{2}$.
D. Δx.
E. None of the above.

---

5. If $f(x) = \sin(x)$ then the linear approximation to $f(\Delta x)$ is $L(\Delta x) =$
A. 0.
B. 1.
C. $\frac{\pi}{2}$.
→*D.* Δx.
E. None of the above.

Quiz 16

---

1. An equation for the tangent line to the curve $y^2 + xy = 8$ at the point $(7, 1)$ is

→*A.* $y - 1 = -\frac{1}{9}(x - 7)$.

B. $y - 1 = -\frac{1}{7}(x - 7)$.

C. $y - 1 = -\frac{9}{7}(x - 7)$.

D. None of the above.

---

2. An equation for the tangent line to the curve $\sin^2(y) = x$ at the point $(\frac{3}{4}, \frac{\pi}{3})$ is

A. $y - \frac{\pi}{3} = -\frac{1}{2}(x - \frac{3}{4})$.

B. $y - \frac{\pi}{3} = \frac{1}{\sqrt{2}}(x - \frac{3}{4})$.

→*C.* $y - \frac{\pi}{3} = \frac{2}{\sqrt{3}}(x - \frac{3}{4})$.

D. None of the above.

---

3. If $f(x) = x^2$ then the linear approximation to $f(2 + \Delta x)$ is $L(\Delta x) =$

A. $2x$.

B. $2\Delta x$.

→*C.* $4\Delta x + 4$.

D. None of the above.

---

4. If $f(x) = \tan(x)$ then the linear approximation to $f(\Delta x)$ is $L(\Delta x) =$

A. 0.

B. 1.

→*C.* Δx.

D. None of the above.

---

5. If $f(x) = \sqrt{x}$ then the linear approximation to $f(9 + \Delta x)$ is $L(\Delta x) =$

A. $\frac{1}{2}x^{-1/2}$.

B. $\frac{1}{2}(\Delta x)^{-1/2}$.

C. $\frac{1}{2}(\Delta x)^{-1/2} + 3$.

→*D.* None of the above.

Quiz 17

---

1. If $x^3y + \sin(y) = \tan(x)$ then $dy/dx =$
- *A.* $(\tan(x)\sec(x) - x^3)/(3x^2 + \cos(y))$.
- *B.* $(\sec^2(x) - x^3)/(3x^2 + \cos(y))$.
- *C.* $(\sec^2(x) - 3x^2)/(x^3 + \cos(y))$.
- →*D.* None of the above.

---

2. If $f(x) = \sin(x^2)$ then $d^2f/dx^2 =$
- *A.* $-2\sin(x^2) + x^2\cos(x^2)$.
- *B.* $-\cos(x^2) \cdot 4x^2$.
- →*C.* $2\cos(x^2) - 4x^2\sin(x^2)$.
- *D.* None of the above.

---

3. The linear approximation to the graph of $x^2 + y^2 = 2$ at the point $(1, 1)$ is $L(\Delta x) =$
- *A.* $-\Delta x$.
- →*B.* $-\Delta x + 1$.
- *C.* $-(\Delta x - 1) + 1$.
- *D.* None of the above.

---

4. If $f(x) = x^2 - 7$ then Newton's Formula for $f(x)$ is $x_{i+1} =$
- →*A.* $\frac{1}{2}(x_i + 7/x_i)$.
- *B.* $2x_i \cdot (x_{i+1} - x_i) + (x_i^2 - 7)$.
- *C.* $2x_i \cdot x_{i+1} - x_i^2 - 7$.
- *D.* All of the above.
- *E.* None of the above.

---

5. The x-intercept of the tangent line to the curve $y = x^3 - 4x + 1$ at the point $(0, 1)$ is
- *A.* 0.
- →*B.* 1/4.
- *C.* -1.
- *D.* None of the above.

Quiz 18

---

1. If $\sin(x-y) = \tan(x+y)$ then $dy/dx =$

A. $(\cos(x-y) - \sec^2(x+y))/(\tan(x+y) + \sin(x-y))$.

B. $(\tan(x+y) + \sin(x-y))/(\cos(x-y) - \sec^2(x+y))$.

→*C.* $(\cos(x-y) - \sec^2(x+y))/(\cos(x-y) + \sec^2(x+y))$.

D. None of the above.

---

2. If the position of an object is given by the formula $s(t) = t^3 + 3t^2 - 9t$ then object is moving forward on

A. $(-3, 1)$.

B. $(-1, +\infty)$.

→*C.* $(-\infty, -3) \cup (1, +\infty)$.

D. None of the above.

---

3. If the position of an object is given by the formula $s(t) = t^3 + 3t^2 - 9t$ then object is accelerating on upwards) on

A. $(-3, 1)$.

→*B.* $(-1, +\infty)$.

C. $(-\infty, -3) \cup (1, +\infty)$.

D. None of the above.

---

4. The linear approximation to the ellipse $4x^2 + y^2 = 8$ at the point $(-1, 2)$ is $L(\Delta x) =$

A. $\frac{1}{2}\Delta x - 1$.

B. $\frac{1}{2}\Delta x + 2$.

→*C.* $2\Delta x + 2$.

D. None of the above.

---

5. If $f(x) = x^n - A$ (where A and n are constant) then Newton's Formula for $f(x)$ is $x_{i+1} =$

A. $\frac{1}{2}(x_i + A/x_i^n)$.

B. $\frac{1}{n}(x_i + A/x_i^{n-1})$.

→*C.* $\frac{1}{n}((n-1)x_i + A/x_i^{n-1})$.

D. None of the above.

Quiz 19

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1. True or false: If $f(x) = \sin(2x)$ then there is a point c in the interval $(0, \pi/4)$ such that $f'(c) = 4/\pi$.
True.

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2. True or false: If $f(x) = \sin(2x)$ then there is a point c in the interval $(0, \pi/4)$ such that $f'(c) = -4/\pi$.
False.

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3. True or false: If $f(x) = \sin(2x)$ then for any points a and b we have that $|f(b) - f(a)| \leq 2 \cdot |b - a|$.
True.

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4. True or false: If $f(x) = -x$ when $x < 0$ and $f(x) = 1$ when $x \geq 0$ then there is a point c in the interval $[-1, 1]$ such that $f(c) \leq f(x)$ for every x in the interval.
False.

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5. True or false: If $f(x) = 2x$ when $x < 1$ and $f(x) = 2$ when $x \geq 1$ then there is a point c in the interval $[0, 3]$ such that $f(c) \geq f(x)$ for every x in the interval.
True.

Quiz 20

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1. True or false: If $f(x) = x^3 - 3x^2 + 1$ then there is a point c in the interval $(0, 1)$ such that $f'(c) = -2$.
True.

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2. True or false: If $f(x) = x^3 - 3x^2 + 1$ then there is a point c in the interval $(-1, 1)$ such that $f'(c) = 1$.
True.

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3. True or false: If $f(x) = x^3 - 3x^2 + 1$ then there is a point c in the interval $(-1, 2)$ such that $f'(c) = 0$.
True.

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4. True or false: If $f(x) = x^3 - 3x^2 + 1$ then for any points a and b in $(0, 2)$ we have that $|f(b) - f(a)| \leq 3 \cdot |b - a|$.
True.

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5. True or false: If $f(x) = x^3 - 3x^2 + 1$ then for any points a and b in $(-1, 1)$ we have that $|f(b) - f(a)| \leq 3 \cdot |b - a|$
False.

Quiz 21

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1. The maximum value of $\left|2x - x^2\right|$ on $[0, 3/2]$ is

→*A*. 1.
B. 3/2.
C. 3/4.
D. None of the above.

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2. The maximum value of $\left|2x - x^2\right|$ on $[-1, 2]$ is

A. 1.
B. 2.
→*C*. 3.
D. None of the above.

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3. The minimum value of $\left|2x - x^2\right|$ on $[-1, 2]$ is

A. 1.
B. 2.
C. 3.
→*D*. None of the above.

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4. True or false: If f is continuous on $[a, b]$ and differentiable on (a, b) then there is a point c in (a, b) such that $f'(c) = 0$.

False.

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5. True or false: If f is continuous on $[a, b]$ and differentiable on (a, b) then there is a point c in (a, b) such that $f(b) - f(a) = f'(c) \cdot (b - a)$.

True.

Quiz 22

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1. If $f(x) = \int_{-3}^{x} \sqrt{t^3+1}\,dt$ then $f'(x) =$

A. $\sqrt{t^3+1}\,dt$.

→*B.* $\sqrt{x^3+1}$.

C. $\frac{1}{2}(t^3+1)^{-1/2} \cdot 3t^2\,dt$.

D. $\frac{1}{2}(x^3+1)^{-1/2} \cdot 3x^2$.

E. None of the above.

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2. If f is continuous on $[a,b]$ then there is a point c in (a,b) such that

A. $\int_a^b f' = (b-a) \cdot f(c)$.

→*B.* $\int_a^b f = (b-a) \cdot f(c)$.

C. $f'(b) - f'(a) = (b-a) \cdot f(c)$.

D. All of the above.

E. None of the above.

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3. If $f(x) = |x|$ then $\int_{-2}^{2} f =$

A. 0.

B. 1.

C. 2.

D. 3.

→*E.* 4.

F. None of the above.

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4. True or false: If f is continuous on (a,b) then f has an antiderivative on (a,b).
True.

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5. True or false: If f is continuous on (a,b) then f has a derivative on (a,b).
False.

Quiz 23

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1. $\int_0^4 \sqrt{x}\,dx =$

A. $1/4$.
$\rightarrow B$. $16/3$.
C. 2.
D. None of the above.

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2. $\int_0^{\pi/4} \sec^2(x)\,dx =$

$\rightarrow A$. 1.
B. 2.
C. $4/\pi$.
D. None of the above.

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3. $\int_1^2 \frac{1}{x^2}\,dx =$

A. 1.
$\rightarrow B$. $1/2$.
C. $-1/2$.
D. None of the above.

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4. $\int_0^{\pi/6} \sin(3x)\,dx =$

A. $\int_0^{\pi/2} \sin(u)\,du$.
$\rightarrow B$. $\frac{1}{3}\int_0^{\pi/2} \sin(u)\,du$.
C. $\frac{1}{3}\int_0^{\pi/6} \sin(u)\,du$.
D. None of the above.

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5. $\int_0^{\sqrt{3}} x\sqrt{x^2+1}\,dx =$

A. $2\sqrt{3}$.
$\rightarrow B$. $7/3$.
C. $\sqrt{8}/3$.
D. None of the above.