

6. What is $\lim_{h \rightarrow 0} \frac{8\left(\frac{1}{2}+h\right)^8 - 8\left(\frac{1}{2}\right)^8}{h}$?
- (A) 0 (B) $\frac{1}{2}$ (C) 1 (D) The limit does not exist.
- (E) It cannot be determined from the information given.
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8. If $h(x) = f^2(x) - g^2(x)$, $f'(x) = -g(x)$, and $g'(x) = f(x)$, then $h'(x) =$
- (A) 0 (B) 1 (C) $-4f(x)g(x)$
- (D) $(-g(x))^2 - (f(x))^2$ (E) $-2(-g(x) + f(x))$
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14. If $y = x^2 + 2$ and $u = 2x - 1$, then $\frac{dy}{du} =$
- (A) $\frac{2x^2 - 2x + 4}{(2x - 1)^2}$ (B) $6x^2 - 2x + 4$ (C) x^2
- (D) x (E) $\frac{1}{x}$
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18. If $f(x) = 2 + |x - 3|$ for all x , then the value of the derivative $f'(x)$ at $x = 3$ is
- (A) -1 (B) 0 (C) 1 (D) 2 (E) nonexistent

22. $\frac{d}{dx}(\ln e^{2x}) =$

- (A) $\frac{1}{e^{2x}}$ (B) $\frac{2}{e^{2x}}$ (C) $2x$ (D) 1 (E) 2

45. If $\frac{d}{dx}(f(x)) = g(x)$ and $\frac{d}{dx}(g(x)) = f(x^2)$, then $\frac{d^2}{dx^2}(f(x^3)) =$

- (A) $f(x^6)$ (B) $g(x^3)$ (C) $3x^2g(x^3)$
(D) $9x^4f(x^6) + 6xg(x^3)$ (E) $f(x^6) + g(x^3)$