

Choose the correct answer in each of the following:

CAPTER 3:

1. If $y = \cos(3\pi)$ then $\frac{dy}{dx} =$

- (a) $-\sin(3\pi)$
 - (b) 0
 - (c) $-3\pi \sin(3\pi)$
 - (d) $3\pi \sin(3\pi)$
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2. If $y = \sqrt{x}(4 + 3x)$ then $\frac{dy}{dx} =$

- (a) $\frac{4}{\sqrt{x}} + \frac{9}{2}\sqrt{x}$
 - (b) $\frac{2}{\sqrt{x}} + \frac{1}{2}\sqrt{x}$
 - (c) $\frac{2}{\sqrt{x}} + \frac{9}{2}\sqrt{x}$
 - (d) $\frac{2}{\sqrt{x}} + \frac{9}{2}x$
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3. If $y = \frac{5x}{x+7}$ then $\frac{dy}{dx} =$

- (a) $\frac{-35}{(x+7)^2}$
 - (b) $\frac{35x}{(x+7)^2}$
 - (c) $\frac{5x+35}{(x+7)^2}$
 - (d) $\frac{35}{(x+7)^2}$
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4. If $y = \frac{g}{f}$ and $f(2) = 3, g(2) = 5, f'(2) = 2, g'(2) = 5$ then $y'(2) =$

- (a) $\frac{25}{9}$
 - (b) $\frac{5}{9}$
 - (c) $-\frac{5}{9}$
 - (d) $-\frac{25}{9}$
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5. The graph of the function $f(x) = \frac{x^3}{3} + \frac{x^2}{2} - 2x$ has a horizontal tangent

at $x =$

- (a) 1, 2
 - (b) -1, 2
 - (c) 1, -2
 - (d) -1, -2
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6. The **slope** of the **tangent line** to the curve $3x^2 + y^3 = 13$ at the point

$(2, 1)$ is

- (a) $m = 4$
 - (b) $m = -4$
 - (c) $m = \frac{-1}{4}$
 - (d) $m = \frac{1}{4}$
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7. If $y = 5 \sin x \sec x$ then $y' =$

- (a) $5 \cos x \sec x \tan x$
 - (b) $5 \sec^2 x$
 - (c) $-5 \cos x \sec x \tan x$
 - (d) $5 \cos x \csc x \cot x$
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8. The 21st derivative of the function $f(x) = \sin x$ is

- (a) $-\sin x$
 - (b) $\cos x$
 - (c) $\sin x$
 - (d) $-\cos x$
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9. The graph of $y = x^2 - 4x + 10$ has a horizontal tangent at $x =$

- (a) -4
 - (b) -2
 - (c) 2
 - (d) 4
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10. If $y + 3x = xy^2$, then $\frac{dy}{dx} =$

- (a) $\frac{y^2 - 3}{1 - xy}$
 - (b) $\frac{y^2 - 3}{2xy - 1}$
 - (c) $\frac{3 - y^2}{1 - 2xy}$
 - (d) $\frac{y^2 - 3}{1 - 2xy}$
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11. If $f(x) = \log_5(5x\sqrt{x+1})$, then $f'(x) =$

- (a) $\frac{1}{\ln 5} \left(\frac{1}{x} + \frac{1}{x+1} \right)$
 - (b) $\frac{1}{\ln 5} \left(\frac{1}{5x} + \frac{1}{2(x+1)} \right)$
 - (c) $\frac{1}{\ln 5} \left(1 - \frac{1}{2(x+1)} \right)$
 - (d) $\frac{1}{\ln 5} \left(\frac{1}{x} + \frac{1}{2(x+1)} \right)$
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12. If $f(x) = 3^{x^3+3x}$, then $f'(x) =$

- (a) $3x^2(\ln 3)3^{x^3+3x}$
(b) $3(\ln 3)3^{x^3+3x}$
(c) $3(x^2 + 1)(\ln 3)3^{x^3+3x}$
(d) $(x^2 + 1)(\ln 3)3^{x^3+3x}$
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13. $\frac{d}{dx} \ln(\sec 5x) =$

- (a) $5 \sin 5x$
(b) $5 \cos 5x$
(c) $5 \tan 5x$
(d) $5 \cot 5x$
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14. If $y = \ln(x^5 \cos^{-3} 2x)$ then $y'' =$

- (a) $-15 \ln(x + \cos 2x)$
(b) $-5x^{-2} + 6 \sec 2x \tan 2x$
(c) $-5x^{-2} + 12 \sec^2 2x$
(d) $5 \ln x + 12 \ln \sin 2x$
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15. If $y = \ln\left(\frac{1}{x^6}\right)$ then $y' =$

- (a) $6x^{-2}$
(b) $-6x^{-1}$
(c) $-6x^{-2}$
(d) $6x^{-1}$
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16. Find y' for $y = x^{x^2}$

- (a) $y' = x^2 x^{x^2-1}$
(b) $y' = 2x^x$
(c) $y' = x^{x^2+1}[1 + 2 \ln x]$
(d) $y' = x + 2x \ln x$
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answers: 1-b, 2-c, 3-d, 4-b, 5-c, 6-b, 7-b, 8-b, 9-c, 10-d, 11-d, 12-c, 13-c, 14-c, 15-b, 16-c.