

AP Calculus Multiple Choice Questions - Chapter 4

1 If $f(x) = \cos^3(4x)$, then $f'(x) =$

- a $3 \cos^2(4x)$ b $-12 \cos^2(4x) \sin(4x)$
c $-3 \cos^2(4x) \sin(4x)$ d $12 \cos^2(4x) \sin(4x)$
e $-4 \sin^3(4x)$

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| | 4.1a |
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2 Find the derivative of the function using the given substitution

$$f(x) = \sin(3x + 1) \quad u = 3x + 1$$

- a $3 \sin(3x + 1)$ b $3 \sin(3x + 1)$
c $\cos(3x + 1)$ d $3 \cos(3x + 1)$

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| | 4.1a |
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3 Find the derivative of the function using the given substitution

$$f(x) = \tan(2x - x^3) \quad u = 2x - x^3$$

- a $(2x - x^3) \sec^2(2 - 3x^2)$ b $\sec^2(2x - x^3)$
c $(2 - 3x^2) \sec(2x - x^3)$ d $(2 - 3x^2) \sec^2(2x - x^3)$

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| | 4.1a |
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AP Calculus Multiple Choice Questions - Chapter 4

1 Which of the following is equal to dy/dx of the curve $x^2 - xy + y^2 = 1$?

a $(y - 2x) / (2y - x)$

b $(y + 2x) / (2y - x)$

c $2x / (x - 2y)$

d $(2x + y) / (x - 2y)$

e $(y + 2x) / x$

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| | 4.2a |
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2 Which of the following is equal to d^2y/dx^2 of the curve $x^2 - xy + y^2 = 1$?

a $-6 / (2y - x)^3$

b $(10y^2 - 10x^2 - 10xy) / (2y - x)^3$

c $(8x^2 - 4xy + 8y^2) / (x - 2y)^3$

d $(10x^2 + 10y^2) / (x - 2y)^3$

e $2 / x$

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| | 4.2a |
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3 Find dy/dx for the curve $x^3 + y^3 + 18xy$

a $(6y - x^2) / (y^2 + 6x)$

b $(6y + x^2) / (y^2 + 6x)$

c $(6y + x^2) / (y^2 - 6x)$

d $(6y - x^2) / (y^2 - 6x)$

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| | 4.2a |
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AP Calculus Multiple Choice Questions - Chapter 4

1 Find the equation of the line that is tangent to the curve at the indicated point
 $x^2 + xy - y^2 = 1$ (2, 3)

a $y + 3 = 1.75(x + 2)$

b $y + 3 = 1.75(x - 2)$

c $y - 3 = 1.75(x + 2)$

d $y - 3 = 1.75(x - 2)$

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| | 4.2c |
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2 Find the equation of the line that is normal to the curve at the indicated point
 $x^2 + xy - y^2 = 1$ (2, 3)

a $y - 3 = -0.57(x - 2)$

b $y - 3 = -0.57(x + 2)$

c $y + 3 = -0.57(x - 2)$

d $y + 3 = -0.57(x + 2)$

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| | 4.2c |
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3 Find the equation of the line that is normal to the curve at the indicated point
 $x^2 + y^2 = 25$ (3, -4)

a $y + 4 = -1.33(x + 3)$

b $y + 4 = -1.33(x - 3)$

c $y + 4 = 1.33(x + 3)$

d $y + 4 = 1.33(x - 3)$

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| | 4.2c |
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AP Calculus Multiple Choice Questions - Chapter 4

1 Which of the following is the first derivative of $f(x) = \sin^{-1}(x/2)$?

a $\frac{2}{\sqrt{4-x^2}}$

b $\frac{1}{\sqrt{4-x^2}}$

c $\frac{2}{4+x^2}$

d $\frac{2}{\sqrt{4-x^2}}$

e $\frac{1}{\sqrt{4-x^2}}$

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| | 4.3a |
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2 Which of the following is the first derivative of $f(x) = \tan^{-1}(3x)$?

a $\frac{3}{1+9x^2}$

b $\frac{1}{1+9x^2}$

c $\frac{1}{1+9x^2}$

d $\frac{3}{1+9x^2}$

e $\frac{3}{\sqrt{1-9x^2}}$

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| | 4.3a |
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2 Which of the following is the first derivative of $f(x) = \sec^{-1}(x^2)$?

a $\frac{2}{x\sqrt{x^4-1}}$

b $\frac{2}{x\sqrt{x^2-1}}$

c $\frac{2}{x\sqrt{1-x^4}}$

d $\frac{2}{x\sqrt{1-x^2}}$

e $\frac{2x}{\sqrt{1-x^4}}$

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| | 4.3a |
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AP Calculus Multiple Choice Questions - Chapter 4

1 What is the slope of the line tangent to the graph of

$$y = \frac{e^{-x}}{x+1} \text{ at } x = 1?$$

- a $-(1/e)$ b $-(3/4e)$
c $-(1/4e)$ d $(1/4e)$
e $(1/e)$

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| | 4.4a |
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2 What is the derivative of the function $f(x) = 2e^x$?

- a $2e^x$ b $4e^x$
c e^x d $0.5e^x$

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| | 4.4a |
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3 What is the derivative of the function 8^x ?

- a 8^x b $\ln 8$
c $8^x \ln 8$ d 16^x

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| | 4.4a |
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