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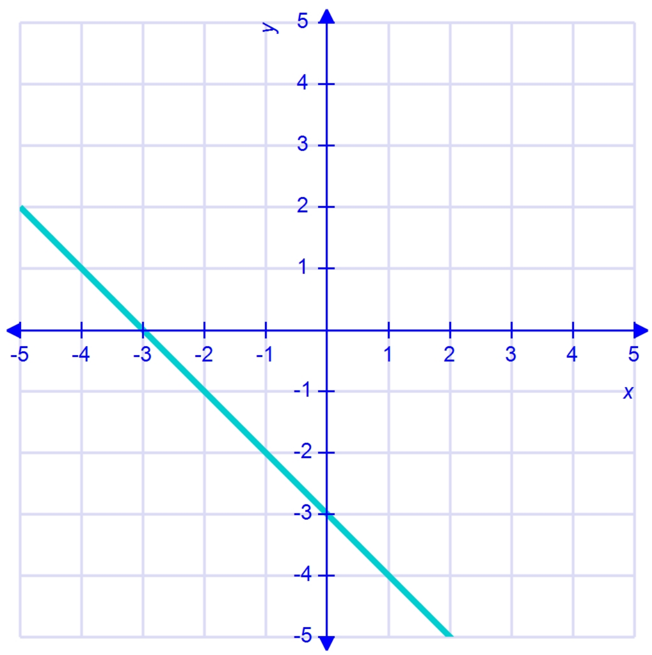
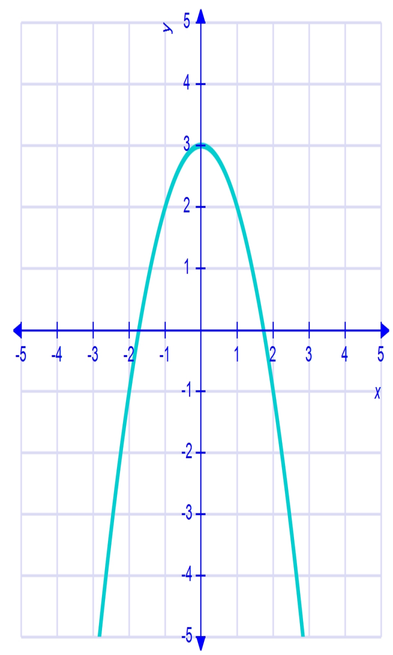
Indicate the answer choice that best completes the statement or answers the question.

___ 1. Which of the following is the correct graph of $y = 3 - x$?

a.



b.



c.

d.

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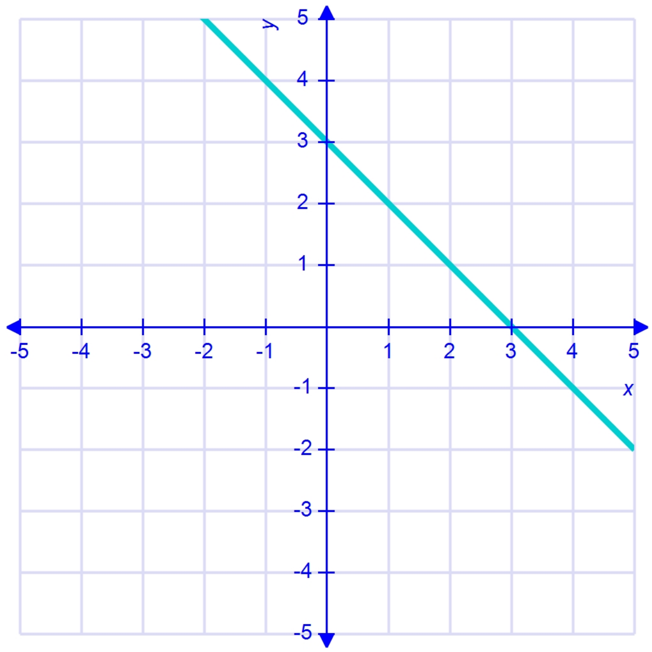
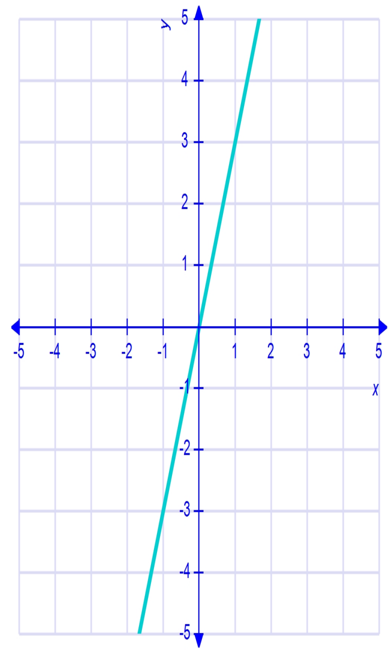
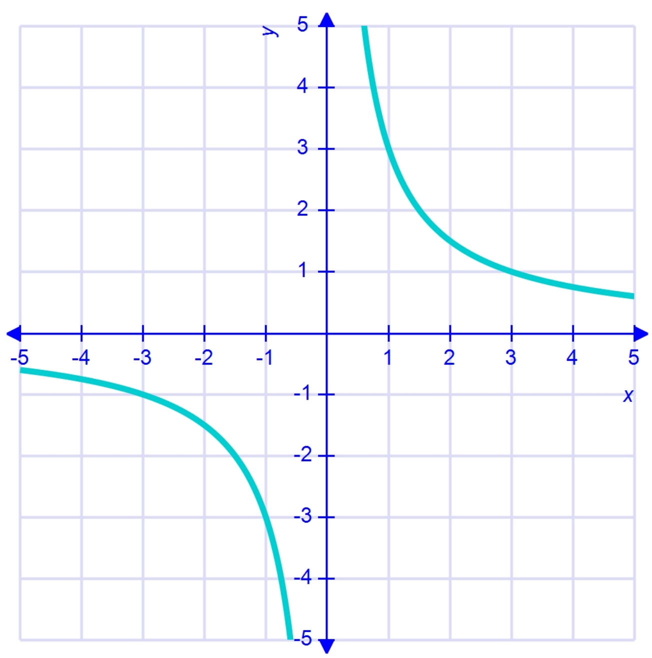




e.



___ 2. Sketch the graph of the equation. $y = | x + 3 |$?

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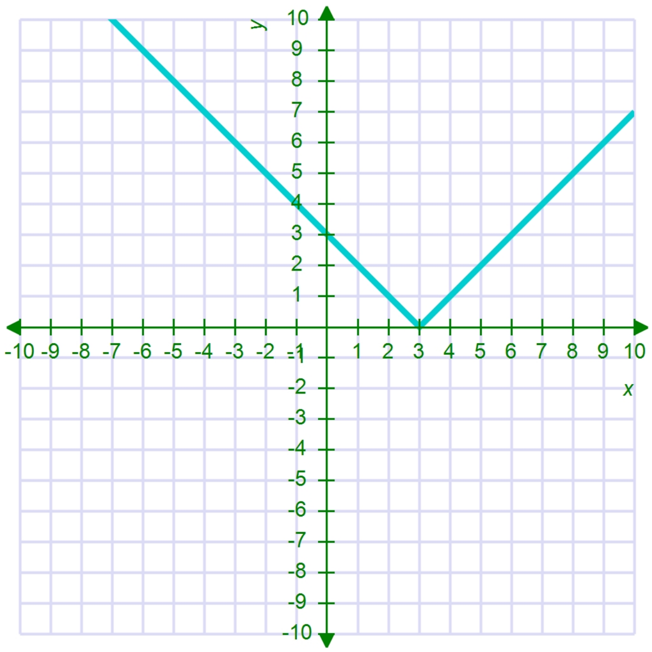
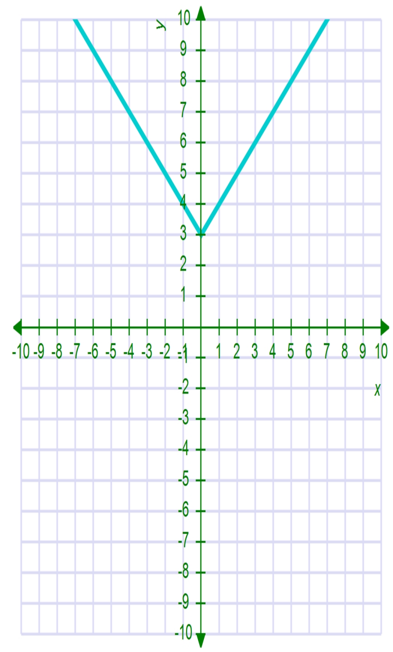
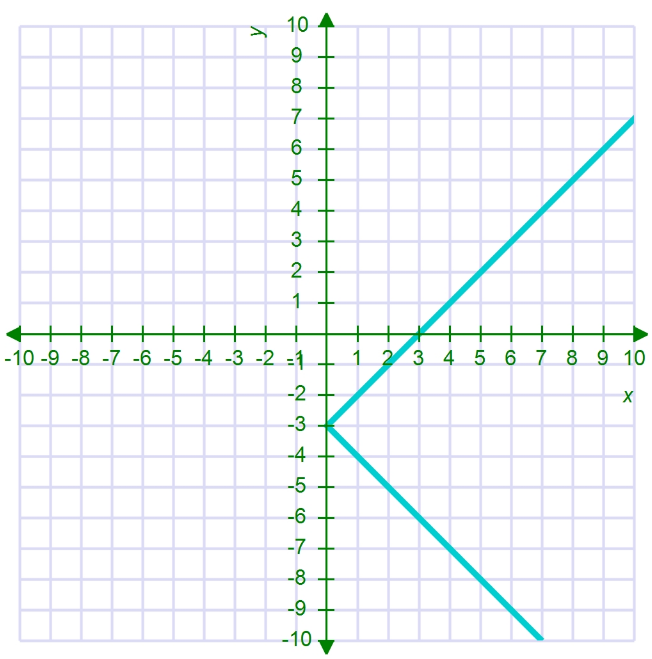
a.



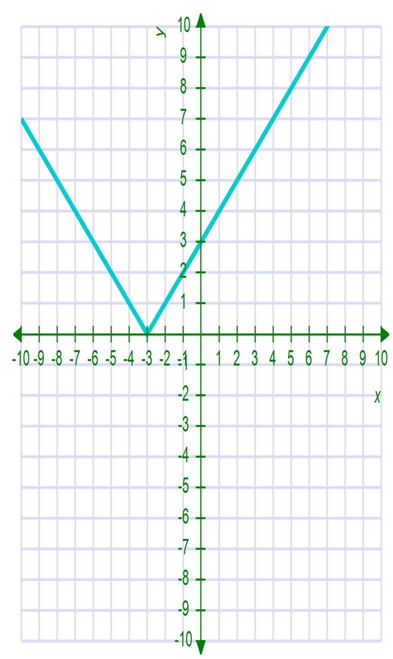
b.



c.



d.



e.

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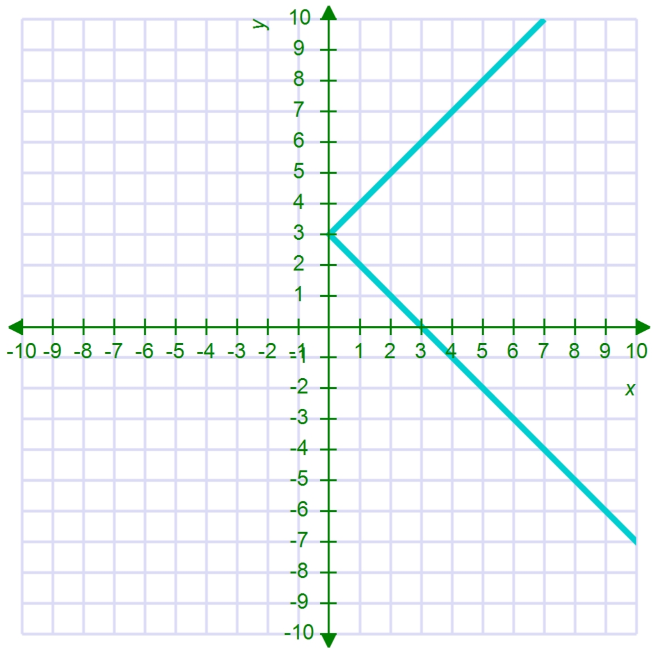

___ 3. Find the x- and y- intercepts of the graph of the equation $y = \dfrac{x^2 - 81}{x + 9}$?

a. x- intercepts: (–9, 0); y- intercepts: (0, 9)

b. x- intercepts: (9, 0), (–9, 0); y- intercepts: (0, –9), (0, 9)

c. x- intercepts: (9, 0); y- intercepts: (0, –9)

d. x- intercepts: (0, –9), (0, 9); y- intercepts: (9, 0), (–9, 0)

e. x- intercepts: (81, 0); y- intercepts: (0, 81)

___ 4. A small business recaps and sells tires. The business has a revenue function $R(x) = 71x$ and a cost function $C(x) = 600 + 65x$, where x represents the number of sets of four tires recapped and sold. Find the number of sets of recaps that must be sold to break even.

a. 100
b. 300
c. 6
d. 200
e. 65

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___ 5. Find the market equilibrium point for the following demand and supply functions below, where p is price per unit and q is the number of units produced and sold.
Demand: $p = 420 - 7q$
Supply: $p = 13q + 80$

a. $q = 25$, $p = 245$
b. $q = 50$, $p = 70$
c. $q = 34$, $p = 182$
d. $q = 17$, $p = 301$
e. $q = 21$, $p = 273$

___ 6. Write the equation of the line passing through the given pair of points.

(–3, 4) and (4, 3)

a. $y = x - 1$
b. $y = \frac{-1}{7}x + \frac{25}{7}$
c. $y = -\frac{-1}{7}x + 25$
d. $y = -x + 7$
e. $y = \frac{-1}{7}x + \frac{7}{25}$

___ 7. In 2004, a product has a value of \$2,175. Over the next five years, its value will increase by \$100 per year. Write a linear equation that gives the dollar value V in terms of the year t. (Let $t = 0$ represent 2000.)

a. $V = 100t + 2{,}175$
b. $V = 100t - 2{,}175$
c. $V = 100t + 1{,}775$
d. $V = 100t + 2{,}575$
e. $V = 100t - 1{,}775$

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___ 8. Complete the table and use the result to estimate the limit. Round your answer to six decimal places.

$$\lim_{x \to 10} \frac{x-10}{x^2+1x-110}$$

x	9.9	9.99	9.999	10.001	10.01	10.1
$f(x)$						

a. 0.047619
b. 0.547619
c. 0.422619
d. 0.672619
e. –0.327381

___ 9. Find the x-values (if any) at which the function $f(x)=15x^2+13x-3$ is not continuous. Which of the discontinuities are removable?

a. continuous everywhere
b. $x = -3$, removable
c. $x = \frac{13}{30}$, removable
d. $x = -\frac{13}{30}$, removable
e. both *B* and *C*

___ 10. Use the limit definition to find the slope of the tangent line to the graph of $f(x)=\sqrt{4x+61}$ at the point $(5, 9)$.

a. $\frac{2}{9}$
b. $-\frac{2}{9}$
c. $\frac{1}{9}$
d. $-\frac{1}{9}$
e. $\frac{1}{5}$

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___ 11. Find the derivative of the following function using the limiting process.

$f(x) = 2x^2 - 6x$

a. 2
b. $4x - 6$
c. $4x + 6$
d. $4x$
e. none of the above

___ 12. For the function given, find $f'(x)$.

$f(x) = x^5 - 9x - 3$

a. $x^4 - 9$
b. $5x^4 - 3$
c. $5x^4 - 9$
d. $5x^5 - 9x$
e. $x^5 - 9x - 3$

___ 13. The profit (in dollars) from selling x units of calculus textbooks is given by $p = -0.05x^2 + 30x - 2{,}000$. Find the additional profit when the sales increase from 146 to 147 units. Round your answer to two decimal places.

a. $15.35
b. $30.00
c. $15.45
d. $30.80
e. $30.60

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___ 14. When the price of a glass of lemonade at a lemonade stand was \$1.75, 400 glasses were sold. When the price was lowered to \$1.50, 500 glasses were sold. Assume that the demand function is linear and that the marginal and fixed costs are \$0.10 and \$25, respectively. Find the profit P as a function of x, the number of glasses of lemonade sold.

a. $P = -0.0025x^2 + 2.65x - 25$

b. $P = 0.0025x^2 + 2.65x - 25$

c. $P = -0.0025x^2 + 2.65x + 25$

d. $P = 0.0025x^2 - 2.65x - 25$

e. $P = 0.0025x^2 + 2.65x + 25$

___ 15. Use the product Rule to find the derivative of the function $f(x) = x(x^2 + 3)$.

a. $f'(x) = 3x^2 + 3$

b. $f'(x) = 3x^2 + 1$

c. $f'(x) = x^2 + 3$

d. $f'(x) = 3x^2 - 3$

e. $f'(x) = 3x^2 - 1$

___ 16. Find the derivative of the function.

$f(x) = x^5(1 + 6x)^6$

a. $f'(x) = x^5(1 + 6x)^4(5 + 66x)$

b. $f'(x) = 6x^5(1 + 6x)^5(5 + 66x)$

c. $f'(x) = x^4(1 + 6x)^6(5 + 66x)$

d. $f'(x) = x^4(1 + 6x)^5(5 + 66x)$

e. $f'(x) = x^4(1 + 6x)^5(5 + 6x)$

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___ 17. You deposit \$1,000 in an account with an annual interest rate of change r (in decimal form) compounded monthly. At the end of 4 years, the balance is $A = 1{,}000\left(1+\frac{r}{12}\right)^{48}$. Find the rate of change of A with respect to r when $r = \$0.08$. Round your answer to two decimal places.

a. \$1,375.67
b. \$65,594.67
c. \$114.64
d. \$5,466.22
e. \$5,430.02

___ 18. Find the second derivative of the function.

$f(x) = 3x^{\frac{4}{7}}$

a. $f''(x) = \frac{-36}{49}x^{\frac{3}{7}}$

b. $f''(x) = \frac{4}{49}x^{\frac{-10}{7}}$

c. $f''(x) = \frac{147}{49}x^{\frac{-10}{7}}$

d. $f''(x) = \frac{-36}{49}x^{\frac{-10}{7}}$

e. None of the above

___ 19. Find the third derivative of the function $f(x) = x^5 - 3x^4$.

a. $60x^2 - 72x$

b. $30x^2 - 36x$

c. $60x^2 - 72x^2$

d. $60x^2 - 36x$

e. $30x^2 - 72x$

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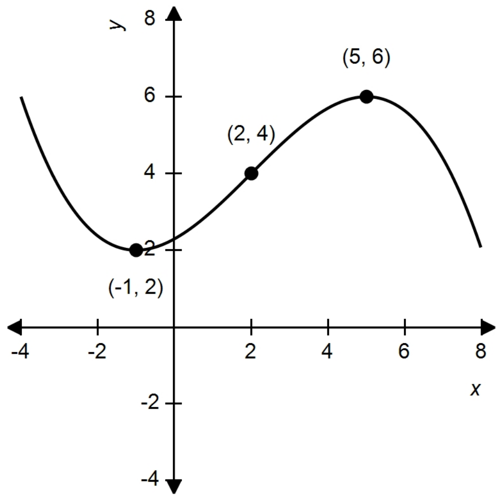
___ 20. Use the graph of $y = f(x)$ to identify at which of the indicated points the derivative $f'(x)$ changes from positive to negative.



a. (5, 6)
b. (-1, 2), (2, 4)
c. (2, 4), (5, 6)
d. (2, 4)
e. (-1, 2)

___ 21. Both a function and its derivative are given. Use them to find all critical numbers.

$$f(x) = x - 9x^{\frac{2}{3}} + 6 \quad f'(x) = \frac{x^{\frac{1}{3}} - 6}{x^{\frac{1}{3}}}$$

a. $x = 0$
b. $x = 216$
c. $x = 0,\ x = -102$
d. $x = 0,\ x = 216$
e. $x = -102,\ x = 216$

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___ 22. Identify the open intervals where the function $f(x) = 5x^2 + 4x + 1$ is increasing or decreasing.

a. decreasing: $\left(-\infty, -\frac{2}{5}\right)$; increasing: $\left(-\frac{2}{5}, \infty\right)$

b. increasing: $\left(-\infty, -\frac{2}{5}\right)$; decreasing: $\left(-\frac{2}{5}, \infty\right)$

c. increasing on $(-\infty, \infty)$

d. decreasing on $(-\infty, \infty)$

e. none of the above

___ 23. Identify the open intervals where the function $f(x) = x\sqrt{22 - x^2}$ is increasing or decreasing.

a. decreasing: $(-\infty, \sqrt{11})$; increasing: $(\sqrt{11}, \infty)$

b. increasing: $(-\sqrt{11}, \sqrt{11})$; decreasing: $(-\sqrt{22}, -\sqrt{11}) \cup (\sqrt{11}, \sqrt{22})$

c. increasing: $(-\infty, \sqrt{22})$; decreasing: $(\sqrt{22}, \infty)$

d. increasing: $(-\sqrt{22}, -\sqrt{11}) \cup (\sqrt{11}, \sqrt{22})$; decreasing: $(-\sqrt{11}, \sqrt{11})$

e. decreasing for all x

___ 24. For the given function, find the critical numbers.

$$y = \frac{x^4}{4} - \frac{x^3}{3} - 7$$

a. $x = 0$ and $x = 1$

b. $x = 0$ and $x = 7$

c. $x = 0$ and $x = -7$

d. $x = 0$ and $x = -1$

e. $x = -1$ and $x = 1$

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___ 25. Find the open intervals on which the function $f(x) = \dfrac{x}{x^2+8}$ is increasing or decreasing.

a. The function is increasing on the interval $-\sqrt{8} < x < \sqrt{8}$, and decreasing on the intervals $-\infty < x < -\sqrt{8}$ and $\sqrt{8} < x < \infty$.

b. The function is increasing on the interval $-\infty < x < -\sqrt{8}$, and decreasing on the intervals $-\sqrt{8} < x < \sqrt{8}$ and $\sqrt{8} < x < \infty$.

c. The function is increasing on the interval $\sqrt{8} < x < \infty$, and decreasing on the intervals $-\infty < x < -\sqrt{8}$ and $-\sqrt{8} < x < \sqrt{8}$.

d. The function is decreasing on the interval $-\sqrt{8} < x < \sqrt{8}$, and increasing on the intervals $-\infty < x < -\sqrt{8}$ and $\sqrt{8} < x < \infty$.

e. The function is decreasing on the interval $-\infty < x < -\sqrt{8}$, and increasing on the intervals $-\sqrt{8} < x < \sqrt{8}$ and $\sqrt{8} < x < \infty$.

___ 26. A fast-food restaurant determines the cost model, $C = 0.5x + 4500,\ 0 \le x \le 30000$ and revenue model, $R = \dfrac{1}{10000}(55000x - x^2)$ for $0 \le x \le 30000$ where x is the number of hamburgers sold. Determine the intervals on which the profit function is increasing and on which it is decreasing.

a. The profit function is increasing on the interval $(25000, 30000)$ and decreasing on the interval $(0, 25000)$.

b. The profit function is increasing on the interval $(0, 22500)$ and decreasing on the interval $(22500, 30000)$.

c. The profit function is increasing on the interval $(0, 25000)$ and decreasing on the interval $(25000, 30000)$.

d. The profit function is increasing on the interval $(22500, 30000)$ and decreasing on the interval $(0, 22500)$.

e. The profit function is increasing on the interval $(0, 4500)$ and decreasing on the interval $(4500, 30000)$.

___ 27. Find the x-values of all relative maxima of the given function.

$$y = \frac{1}{3}x^3 - 5x^2 + 24x + 2$$

a. $x = 0$
b. $x = 6$
c. $x = 5$
d. $x = 4$
e. no relative maxima

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___ 28. Find all relative minima of the given function.

$y = x^4 - 8x^3 + 16x^2 + 18$

a. (0, 18)
b. (2, 34)
c. (4, 18)
d. (0, 18), (4, 18)
e. no relative maxima

___ 29. Find the x-value at which the absolute minimum of $f(x)$ occurs on the interval $[a,b]$.

$f(x) = x^3 - 12x + 2$, $[-6, 3]$

a. $x = -6$
b. $x = -2$
c. $x = 0$
d. $x = 2$
e. $x = 3$

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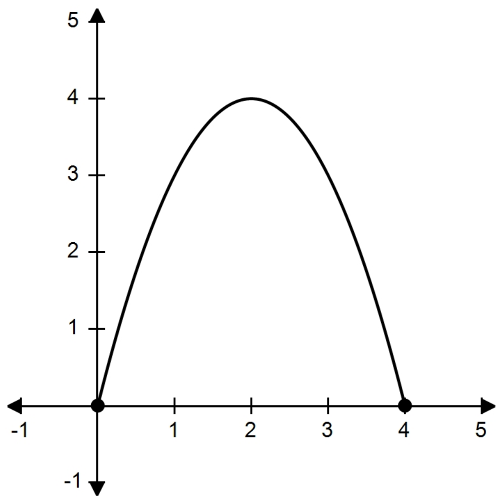
___ 30. Approximate the critical numbers of the function shown in the graph and determine whether the function has a relative maximum, a relative minimum, an absolute maximum, an absolute minimum, or none of these at each critical number on the interval shown.



a. The critical number $x = 0$ yields an absolute minimum and the critical number $x = 4$ yields an absolute maximum.

b. The critical number $x = 0$ yields an absolute maximum and the critical number $x = 4$ yields an absolute minimum.

c. Both the critical numbers $x = 0$ & $x = 4$ yield an absolute minimum.

d. Both the critical numbers $x = 0$ and $x = 4$ yield an absolute maximum.

e. Both the critical numbers $x = 0$ & $x = 4$ yield a relative minimum.

___ 31. Graph a function on the interval $[-1, 3]$ having the following characteristics.

Absolute maximum at $x = 3$
Absolute minimum at $x = -1$
Relative minimum at $x = 2$
Relative maximum at $x = 0.2$

a.

b.

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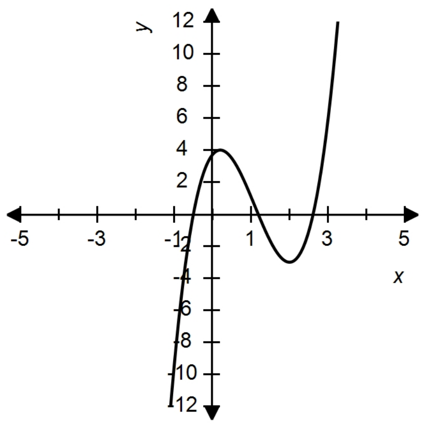
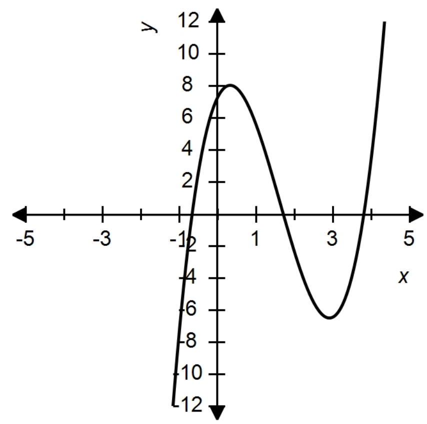
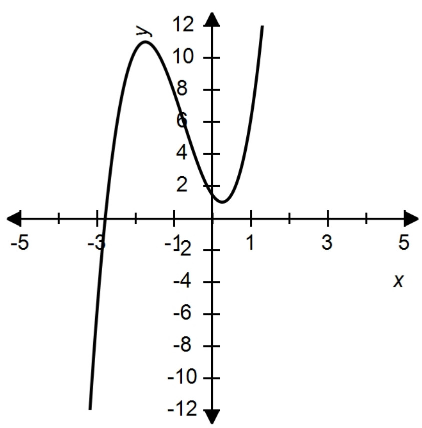
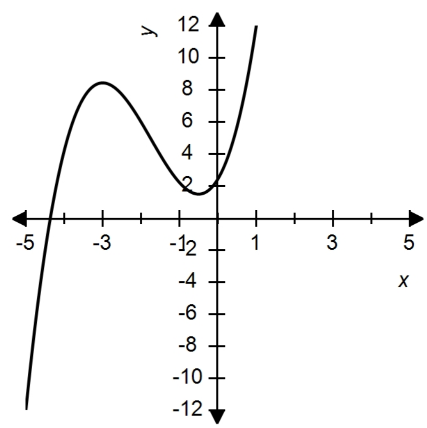




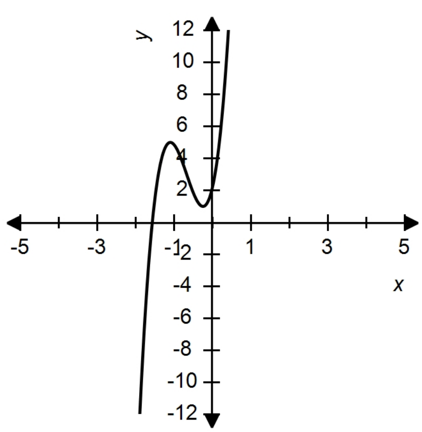
c.



d.



e.



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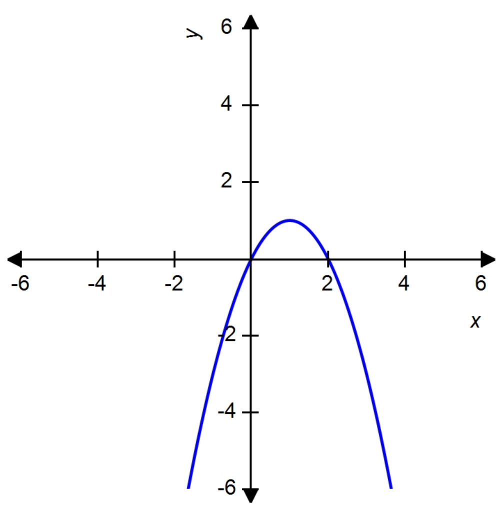
___ 32. Find all relative extrema of the function $x^4 - 12x^3 + 3$. Use the Second Derivative Test where applicable.

a. relative max: $f(18) = 34{,}995$; no relative min
b. relative max: $f(9) = 2{,}184$; no relative min
c. no relative max or min
d. relative min: $f(18) = 34{,}995$; no relative max
e. relative min: $f(9) = -2{,}184$; no relative max

___ 33. Find all relative extrema of the function $f(x) = x^{\frac{2}{3}} + 5$. Use the Second Derivative Test where applicable.

a. relative max: $f(1) = 6$
b. relative min: $f(0) = 5$
c. no relative max or min
d. both A and B
e. none of the above

___ 34. The graph of f is shown in the figure. Sketch a graph of the derivative of f.



a.

b.

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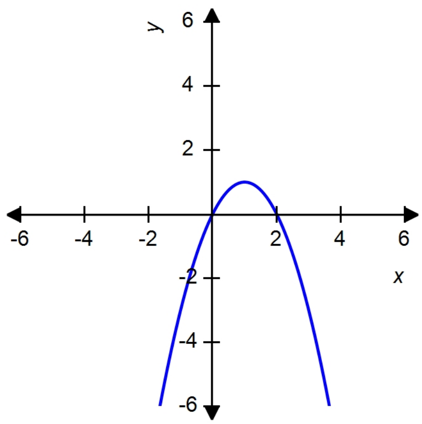
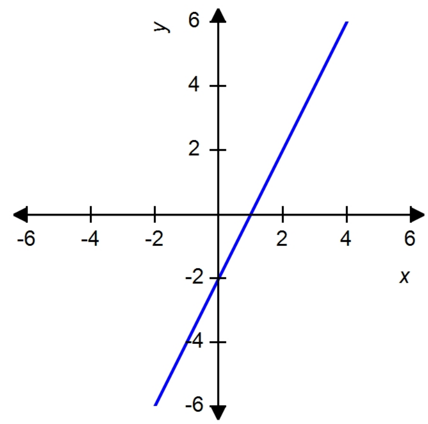
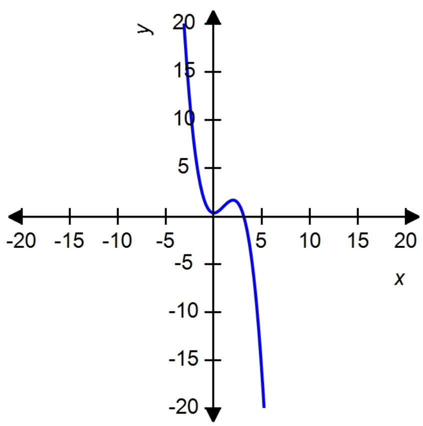
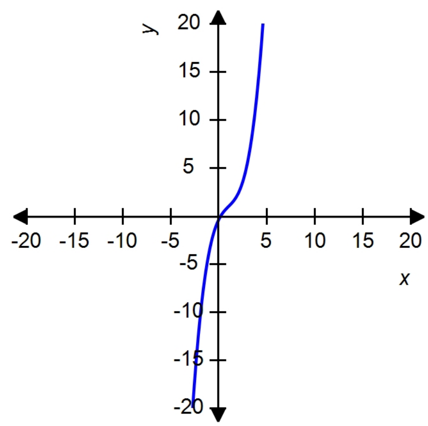




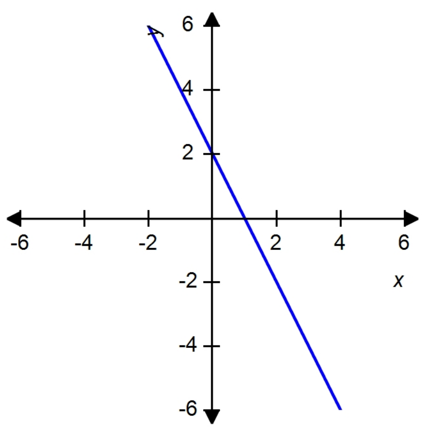
c.



d.



e.



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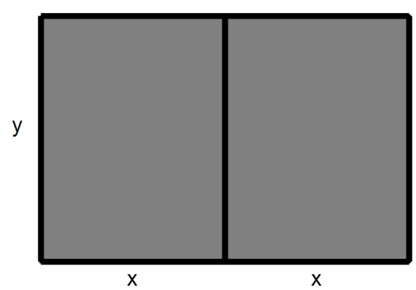
___ 35. ***Production.*** Suppose that the total number of units produced by a worker in t hours of an 8-hour shift can be modeled by the production function $P(t)$: $P(t) = 90t + 42t^2 - 2t^3$. Find the number of hours before the rate of production is maximized. That is, find the point of diminishing returns.

a. $t = 0$
b. $t = 7$
c. $t = 5$
d. $t = 8$
e. $t = 15$

___ 36. A rancher has 440 feet of fencing to enclose two adjacent rectangular corrals (see figure). What dimensions should be used so that the enclosed area will be a maximum?



a. $x = 55.00$ and $y = 73.33$
b. $x = 11.00$ and $y = 132.00$
c. $x = 22.00$ and $y = 146.67$
d. $x = 73.33$ and $y = 55.00$
e. $x = 33.00$ and $y = 88.00$

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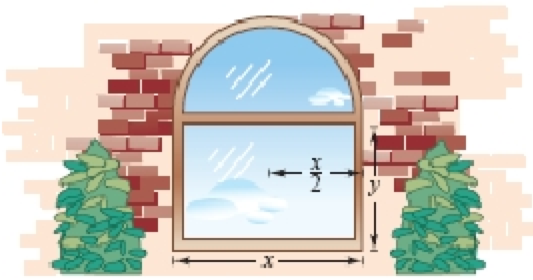
___ 37. A Norman window is constructed by adjoining a semicircle to the top of an ordinary rectangular window (see figure). Find the dimensions of a Norman window of maximum area if the total perimeter is 22 feet. Round yours answers to two decimal places.



a. $x = 6.16$ feet and $y = 3.08$ feet

b. $x = 3.08$ feet and $y = 7.04$ feet

c. $x = 2.05$ feet and $y = 8.36$ feet

d. $x = 5.16$ feet and $y = 4.37$ feet

e. $x = 7.16$ feet and $y = 1.8$ feet

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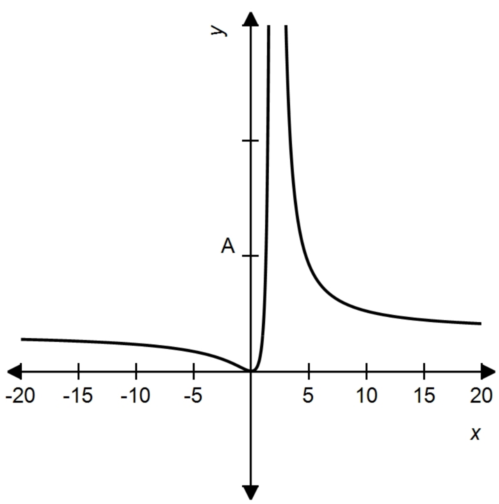
___ 38. A function and its graph are given. Use the graph to find the horizontal asymptotes, if they exist, where $A = 30$ Confirm your results analytically.

$$f(x) = \frac{10x^2}{(x-2)^2}$$



a. $y = 5$

b. $y = 10$

c. $y = 2$

d. $y = 1$

e. no horizontal asymptotes

___ 39. Find the limit:

$$\lim_{x \to 15^+} \frac{x-9}{-x+15}$$

a. ∞

b. $-\infty$

c. 0

d. -1

e. 1

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___ 40. Find the limit.

$$\lim_{x \to \infty} \frac{5x^2 - 5x - 12}{1 - 4x - 7x^2}$$

a. $-\frac{5}{7}$

b. 12

c. –12

d. $\frac{5}{7}$

e. $\frac{5}{4}$

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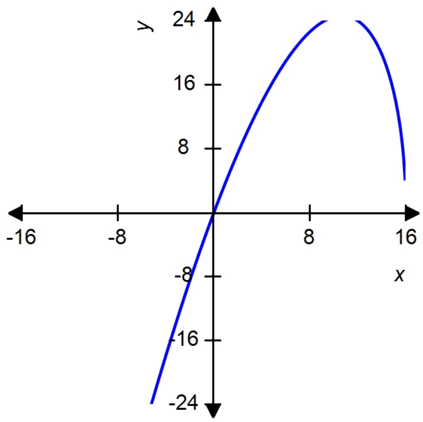
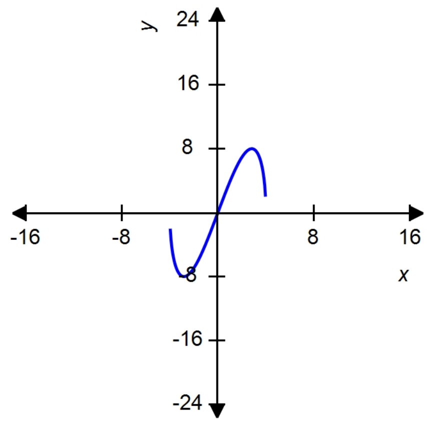
___ 41. Analyze and sketch a graph of the function $y = x\sqrt{16 - x}$.

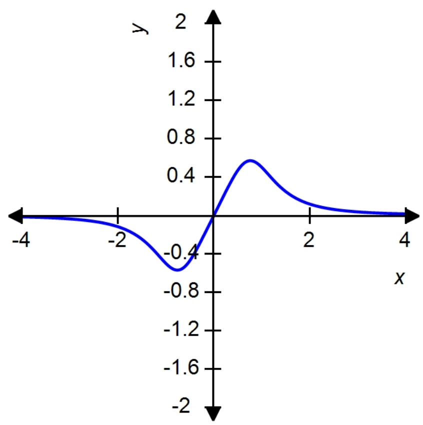
a.



b.



c.



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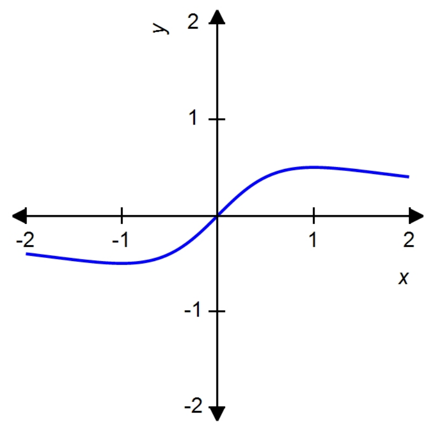

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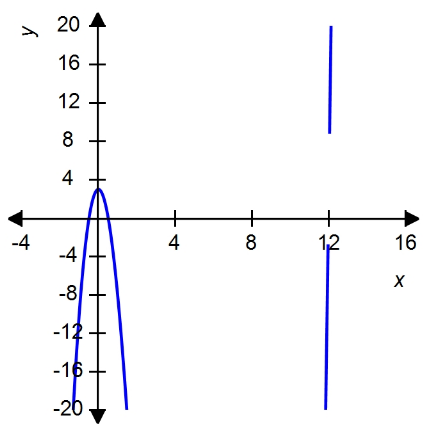

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___ 42. The measurement of the circumference of a circle is found to be 54 centimeters, with a possible error of 0.7 centimeters. Approximate the percent error in computing the area of the circle.

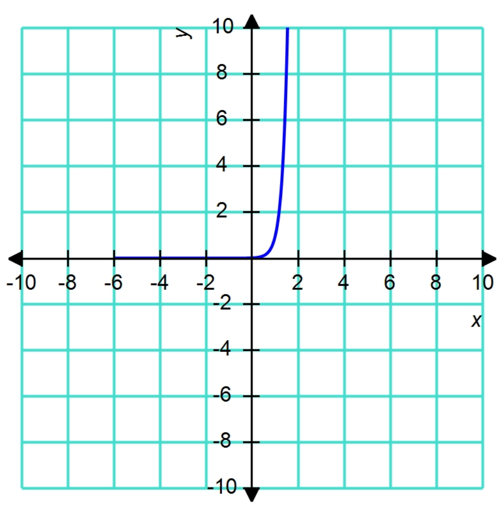
a. 3.70 %
b. 1.30 %
c. 2.59 %
d. 5.19 %
e. 1.85 %

___ 43. Suppose that the annual rate of inflation averages 4% over the next 10 years. With this rate of inflation, the approximate cost C of goods or services during any year in that decade will be given by $C(t) = P(1.04)^t$, $0 \le t \le 10$ where t is time in years and P is the present cost. If the price of an oil change for your car is presently \$25.95, estimate the price 10 years from now. Round your answer to two decimal places.

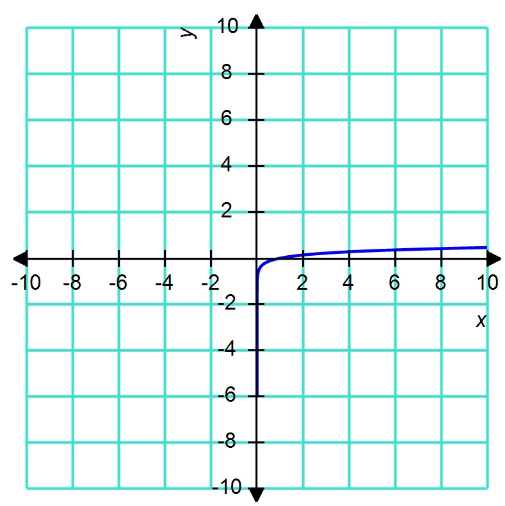
a. \$39.95
b. \$40.41
c. \$41.95
d. \$43.41
e. \$38.41

___ 44. Sketch the graph of the function $f(x) = e^{5x}$.

a.



b.



c.

d.

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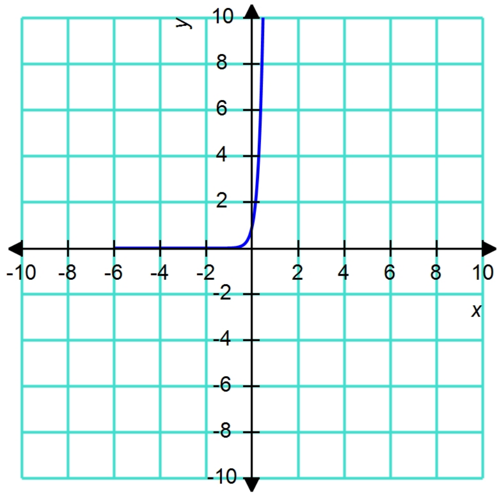
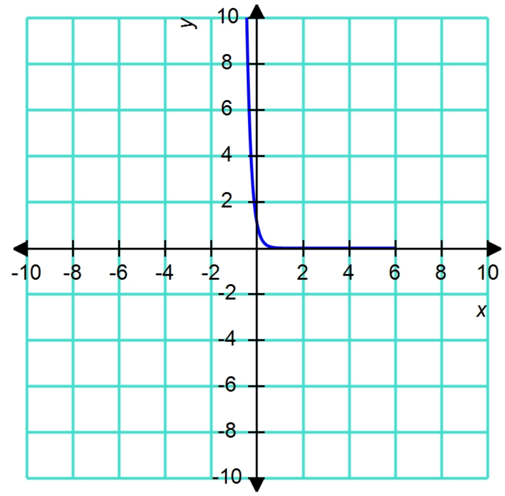
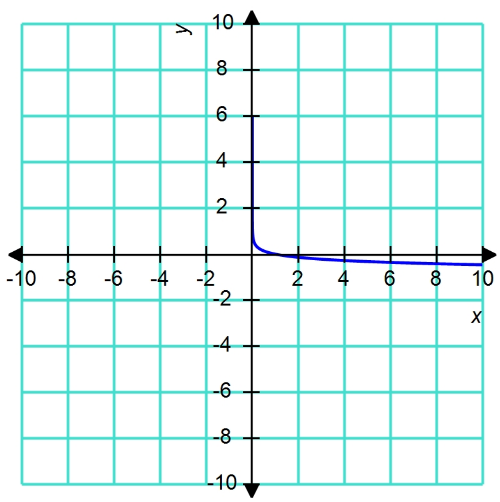




e.



___ 45. The average time between incoming calls at a switchboard is 3 minutes. If a call has just come in, the probability that the next call will come within the next t minutes is $P(t) = 1 - e^{-\frac{t}{3}}$. Find the probability that the next call will come within the next $\frac{5}{6}$ minute. Round your answer to two decimal places.

a. 24.25%
b. 2.43%
c. 175.75%
d. 26.48%
e. 5.97%

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___ 46. Find the derivative of the following function.

$y = 9 - 3e^{-x^7}$

a. $y' = 21x^6 e^{-x^7}$

b. $y' = -21x^6 e^{-x^7}$

c. $y' = 3e^{-x^7}$

d. $y' = 3x^7 e^{-x^7}$

e. $y' = -3x^7 e^{-x^7}$

___ 47. Find an equation of the tangent line to the graph of $y = e^{10x}$ at the point $(0,\ 1)$.

a. $y = x + 1$
b. $y = \ln(10)x + 1$
c. $y = 11x + 1$
d. $y = 10x + 1$
e. $y = 10x - 1$

___ 48. Find $f''(x)$, if $f(x) = (5 + 7x)e^{-6x}$.

a. $f''(x) = (96 - 252x)e^{-6x}$

b. $f''(x) = (-96 - 252x)e^{-6x}$

c. $f''(x) = -96(5 + 7x)e^{-6x}$

d. $f''(x) = -(23 + 42x)e^{-6x}$

e. $f''(x) = (96 + 252x)e^{-6x}$

___ 49. Simplify $e^{\ln\left(9x^2\right)}$.

a. $-x^2$

b. $-9x^2$

c. $9x$

d. $9x^2$

e. x^2

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___ 50. Use the properties of logarithms to expand $\ln\left(\frac{x^2-4}{x^9}\right)^2$.

a. $2[\ln(x+2)-\ln(x-2)-9\ln x]$
b. $2[\ln(x+2)+\ln(x-2)+9\ln x]$
c. $2[\ln(x+2)-\ln(x-2)-\ln x]$
d. $2[\ln(x+2)+\ln(x-2)+\ln x]$
e. $2[\ln(x+2)+\ln(x-2)-9\ln x]$

___ 51. Write the expression $2\ln(3)-\frac{1}{3}\ln(x^2+4)$ as the logarithm of a single quantity.

a. $\ln\left[\frac{9}{(x^2+4)^3}\right]$
b. $\ln(9\sqrt[3]{x^2+4})$
c. $\ln\left[\frac{8}{\sqrt[3]{x^2+4}}\right]$
d. $\ln(8\sqrt[3]{x^2+4})$
e. $\ln\left[\frac{9}{\sqrt[3]{x^2+4}}\right]$

___ 52. Solve $\left(15-\frac{0.528}{22}\right)^{4t}=50$ for t. Round your answer to four decimal places.

a. 1.4454
b. 0.3611
c. 2.6344
d. 0.3614
e. 2.7184

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___ 53. Find the derivative of the following function.

$y = \ln x^2$

a. $\frac{1}{x}$

b. $\frac{2}{x}$

c. $\frac{1}{2x}$

d. $\frac{1}{x^2}$

e. $\frac{1}{2x^2}$

___ 54. Find the derivative of the function $y = \ln\sqrt{x^2+3}$.

a. $\frac{2x}{x^2+3}$

b. $\frac{x}{2x+3}$

c. $\frac{1}{\sqrt{x^2+3}}$

d. $\frac{2x}{\sqrt{x^2+3}}$

e. $\frac{x}{x^2+3}$

___ 55. Find y'.

$y = 8(\ln x)^{-4}$

a. $-\dfrac{64}{x(\ln x)^5}$
b. $-\dfrac{16}{x(\ln x)^5}$
c. $-\dfrac{32}{x(\ln x)^5}$
d. $-\dfrac{32}{x(\ln x)^3}$
e. $-\dfrac{16}{x(\ln x)^3}$

___ 56. Carbon-14 (^{14}C) dating assumes that the carbon on the Earth today has the same radioactive content as it did centuries ago. If this is true, then the amount of ^{14}C absorbed by a tree that grew several centuries ago should be the same as the amount of ^{14}C absorbed by a similar tree today. A piece of ancient charcoal contains only 24% as much of the radioactive carbon as a piece of modern charcoal. How long ago was the tree burned to make the ancient charcoal? (The half-life of ^{14}C is 5715 years.) Round your answer to the nearest integer.

a. 2,776 years
b. 30,751 years
c. 2,781 years
d. 11,767 years
e. 11,772 years

___ 57. The management of a factory finds that the maximum number of units a worker can produce in a day is 30. The learning curve for the number of units N produced per day after a new employee has worked days is modeled by $N = 30 \cdot (1 - e^{kt})$. After 20 days on the job, a worker is producing 19 units in a day. How many days should pass before this worker is producing 25 units per day?

a. about 36 days.
b. about 45 days.
c. about 30 days.
d. about 10 days.

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___ 58. Find the indefinite integral and check the result by differentiation.

$$\int(-16x+7)\mathrm{d}x$$

a. $-8x^2+7x+C$

b. $-16x^2+7x+C$

c. $-16x^2-7x+C$

d. $-16x+C$

e. none of the above

___ 59. Evaluate the integral $\int\left(11+x^{\frac{11}{2}}\right)\mathrm{d}x$.

a. $11x+\frac{2}{13}x^{\frac{13}{2}}+C$

b. $11x+\frac{13}{2}x^{\frac{13}{2}}+C$

c. $\frac{121}{2}+\frac{2}{13}x^{\frac{13}{2}}+C$

d. $\frac{11}{2}x^{\frac{9}{2}}+C$

e. $\frac{11}{2}x^{\frac{13}{2}}+C$

___ 60. The graph of the derivative of a function is given below. Sketch the graphs of *two* functions that have the given derivative.

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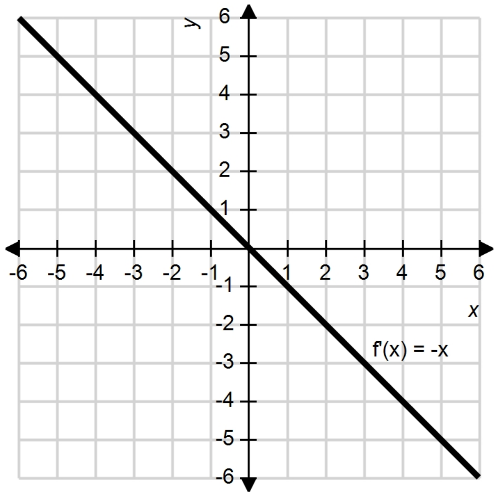
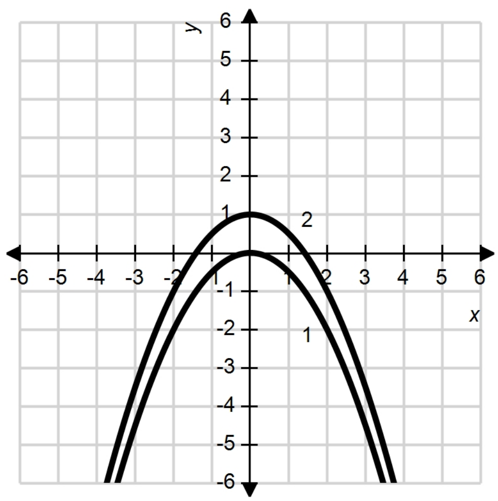


a.

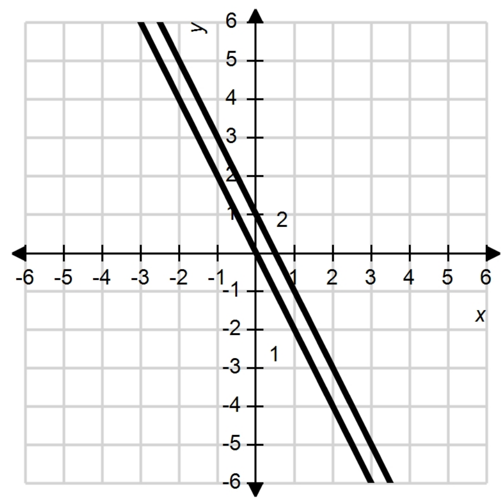
b.



$$1\text{: } f(x) = -\frac{x^2}{2}$$

$$2\text{: } f(x) = -\frac{x^2}{2} + 1$$

c.



$$1\text{: } f(x) = -2x$$
$$2\text{: } f(x) = -2x + 1$$

d.

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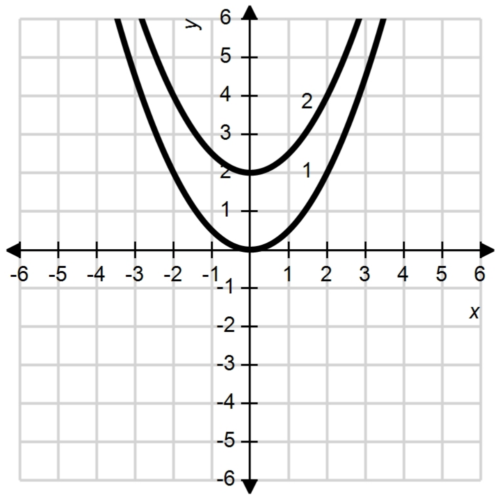
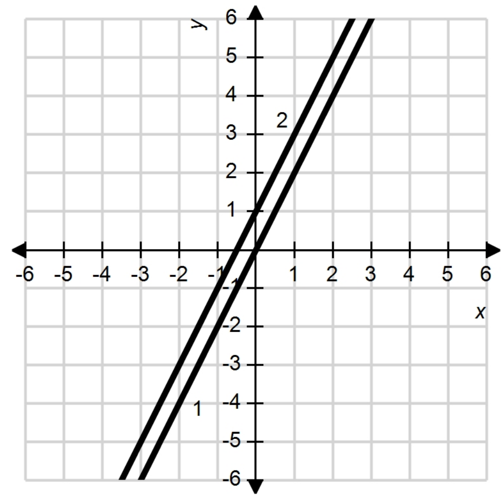


1: $f(x) = \dfrac{1}{2}x^2$

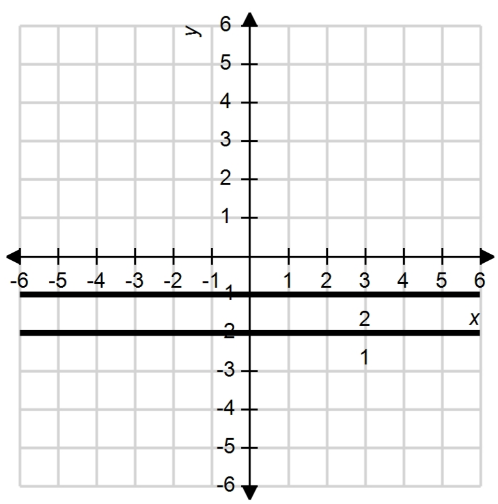
2: $f(x) = \dfrac{1}{2}x^2 + 2$



1: $f(x) = 2x$

2: $f(x) = 2x + 1$

e.



1: $f(x) = -2$

2: $f(x) = -1$

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___ 61. Find the cost function for the marginal cost $\dfrac{dC}{dx} = \dfrac{1}{10}x^4 + 21$ and fixed cost of $2,800 (for $x = 0$).

a. $C(x) = \dfrac{1}{40}x^6 + 21x + 2{,}800$

b. $C(x) = \dfrac{1}{50}x^5 + 2{,}800x + 21$

c. $C(x) = \dfrac{1}{50}x^5 + 21x + 2{,}800$

d. $C(x) = \dfrac{1}{40}x^6 + 2{,}800x + 21$

e. $C(x) = \dfrac{1}{50}x^6 + 21x + 2{,}800$

___ 62. Find the particular solution that satisfies the differential equation $f'(x) = \dfrac{1}{1}x - 14$ and initial condition $f(2) = -26$.

a. $f(x) = \dfrac{1}{3}x^2 - 14x$

b. $f(x) = \dfrac{1}{5}x^2 + 14x - 290$

c. $f(x) = \dfrac{1}{2}x^2 - 14x$

d. $f(x) = \dfrac{1}{2}x^2 - 14x - 290$

e. $f(x) = \dfrac{1}{3}x^2 + 14x$

___ 63. A ball is thrown vertically upwards from a height of 6 ft with an initial velocity of 40 ft per second.

How high will the ball go?

a. 29.03 ft
b. 29.34 ft
c. 30.89 ft
d. 25.02 ft
e. 32.12 ft

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___ 64. Find the indefinite integral of the following function and check the result by differentiation.

$$\int (1+7x)^7 \mathrm{d}x$$

a. $8(1+7x)^8 + C$

b. $\dfrac{(1+7x)^8}{7} + C$

c. $\dfrac{(1+7x)^8}{8} + C$

d. $\dfrac{(1+7x)^8}{56} + C$

e. none of the above

___ 65. Find the indefinite integral of the following function and check the result by differentiation.

$$\int s^8 \sqrt{(4+s^9)}\, \mathrm{d}s$$

a. $\dfrac{(4+s^9)^{\frac{3}{2}}}{36} + C$

b. $\dfrac{2(4+s^9)^{\frac{2}{3}}}{45} + C$

c. $\dfrac{(4+s^9)^{\frac{3}{2}}}{45} + C$

d. $\dfrac{2(4+s^9)^{\frac{3}{2}}}{27} + C$

e. none of the above

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___ 66. Evaluate the integral $\int e^{7x}\mathrm{d}x$.

a. $\frac{1}{7}e^{7x}+C$

b. $7e^{7x}+C$

c. $\frac{1}{8}e^{8x}+C$

d. $7e^{6x}+C$

e. $\frac{1}{6}e^{6x}+C$

___ 67. Sketch the region whose area is given by the definite integral and then use a geometric formula to evaluate the integral.

$$\int_{1}^{3} 5x\,\mathrm{d}x$$

a. –20
b. 100
c. –100
d. 20
e. 7

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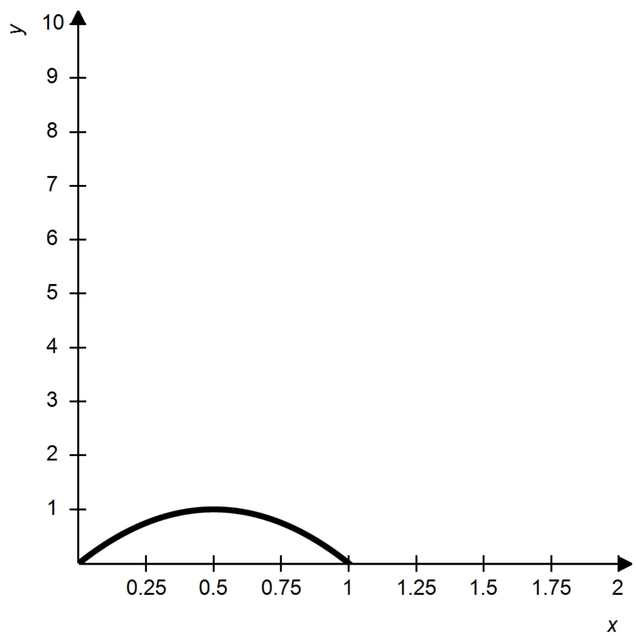
___ 68. Determine the area of the given region.

$y = 4x(1-x)$



a. $\frac{3}{44}$

b. $\frac{2}{3}$

c. $\frac{52}{3}$

d. $\frac{3}{52}$

e. None of the above

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___ 69. Evaluate the definite integral $\int_{9}^{10} (x-10)^9 dx$.

a. $\frac{1}{9}$

b. $\frac{1}{11}$

c. $-\frac{1}{9}$

d. $\frac{1}{10}$

e. $-\frac{1}{10}$

___ 70. The rate of depreciation of a building is given by $D'(t) = 5{,}200(10-t)$ dollars per year, $0 \le t \le 10$. Use the definite integral to find the total depreciation over the first 10 years.

a. $260,000
b. $26,000
c. $130,000
d. $13,487
e. $520,000

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Answer Key

1. c

2. d

3. c

4. a

5. d

6. b

7. c

8. a

9. a

10. a

11. b

12. c

13. a

14. a

15. a

16. d

17. d

18. d

19. a

20. a

21. d

22. a

23. b

24. a

25. a

26. c

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27. d

28. d

29. a

30. c

31. a

32. e

33. b

34. e

35. b

36. a

37. a

38. b

39. b

40. a

41. a

42. c

43. e

44. c

45. a

46. a

47. d

48. e

49. d

50. e

51. e

52. d

53. b

54. e

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55. c

56. d

57. a

58. a

59. a

60. a

61. c

62. c

63. c

64. d

65. d

66. a

67. d

68. b

69. e

70. a