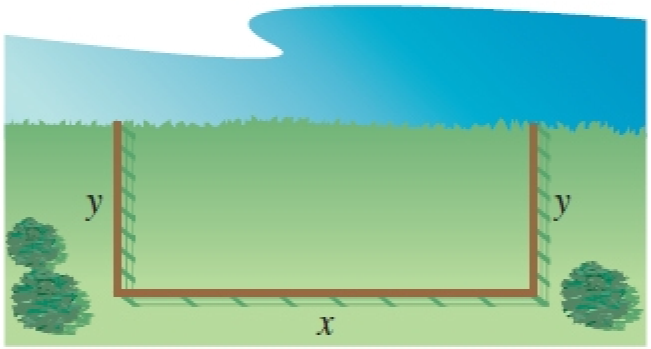
Name:________________________ Class:__________________ Date:__________

Assessment#2

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

___ 1. A farmer plans to fence a rectangular pasture adjacent to a river (see the figure below). The pasture must contain 720,000 square meters in order to provide enough grass for the herd. No fencing is needed along the river. What dimensions will require the least amount of fencing?



a. $x = 600$ and $y = 1{,}200$

b. $x = 1{,}000$ and $y = 720$

c. $x = 1{,}200$ and $y = 600$

d. $x = 720$ and $y = 1{,}000$

e. none of the above

___ 2. Find all points of inflection of the graph of the function $f(x) = 2\sin(10x) + \sin(20x)$ on the interval $(0, 0.628)$. Round your answer to three decimal places wherever applicable.

a. (0.182, 1.452), (0.314, 0), (0.446, –1.452)

b. (0.204, 0.97), (0.534, –0.011)

c. (0.314, 0), (0.446, –1.452)

d. (0.182, 1.452), (0.314, 0), (0.468, –1.934)

e. (0.182, 1.452), (0.446, –1.452)

___ 3. Sketch a graph of the function $f(x) = x\tan x - 4$ over the interval $-\frac{3\pi}{2} \le x \le \frac{3\pi}{2}$.

a.

b.

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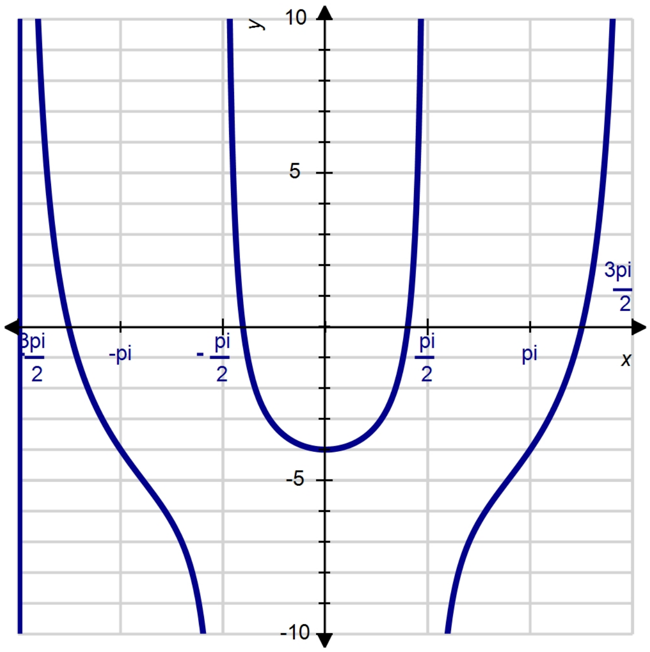
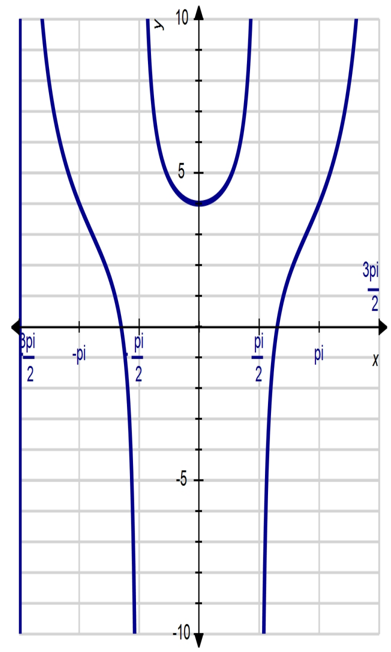
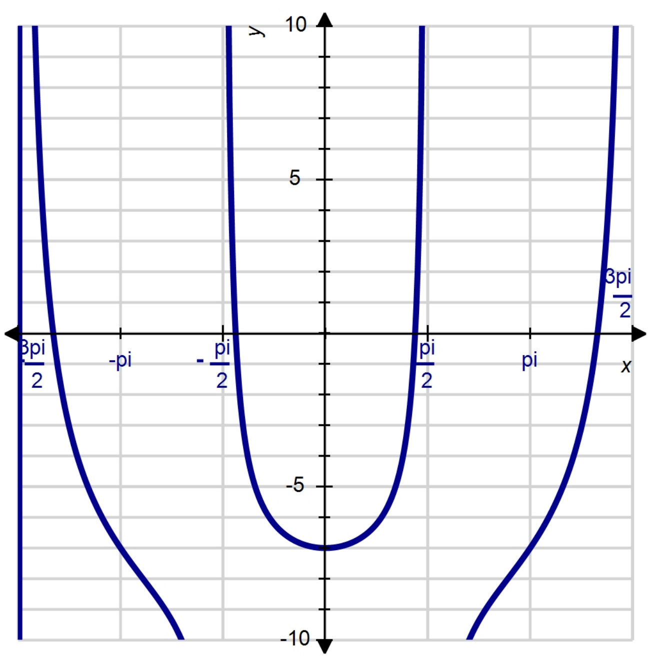
Assessment#2

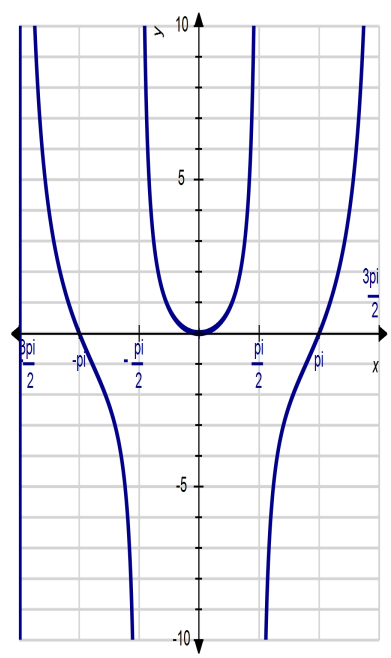




c.

d.





e.

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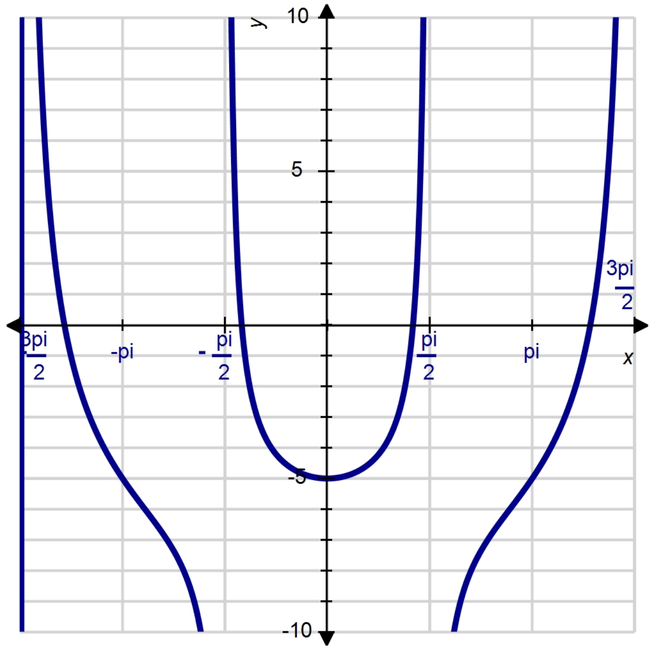
Assessment#2



___ 4. Find the point on the graph of the function $f(x) = (x + 1)^2$ that is closest to the point $(-6, 1)$. Round all numerical values in your answer to four decimal places.

a. (–2.4797, 2.1895)
b. (3.1348, 2.1895)
c. (2.4797, 2.1895)
d. (2.4797, 3.1348)
e. (–3.1348, 2.4797)

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Assessment#2

___ 5. Locate the absolute extrema of the function $f(x) = \cos(\pi x)$ on the closed interval $\left[0, \frac{1}{3}\right]$.

a. absolute max: $(0,1)$; absolute min: $\left(\frac{1}{3}, \cos\left(\frac{\pi}{3}\right)\right)$

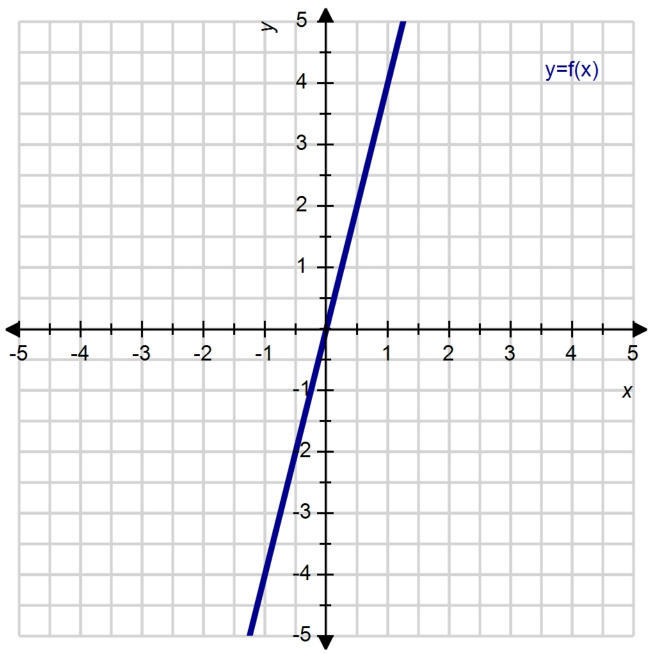
b. absolute max: $\left(\frac{1}{3}, \cos\left(\frac{\pi}{3}\right)\right)$; absolute min: $(0,1)$

c. absolute max: $\left(\frac{1}{3}, \cos\left(\frac{\pi}{3}\right)\right)$; no absolute min

d. no absolute max; absolute min: $(0,1)$

e. absolute max: $(0,1)$; no absolute min

___ 6. The graph of *f* is shown in the figure. Sketch a graph of the derivative of *f*.



a.

b.

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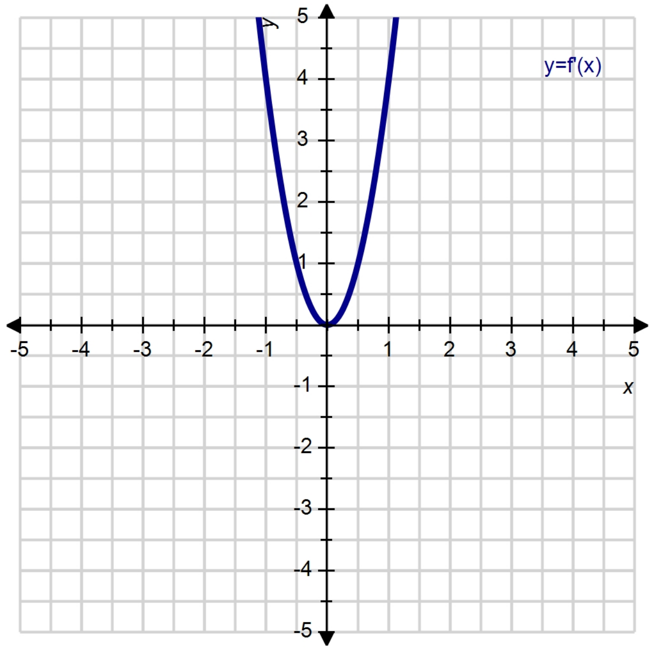
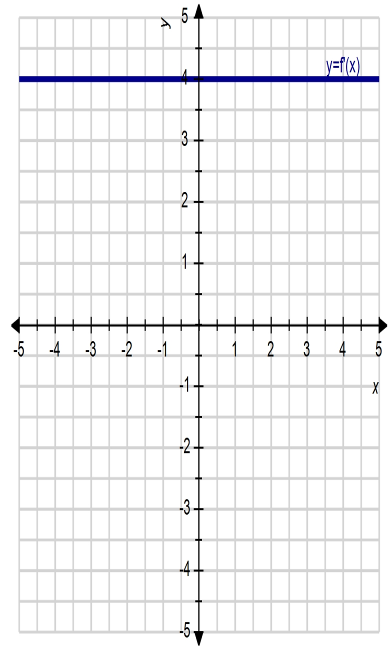
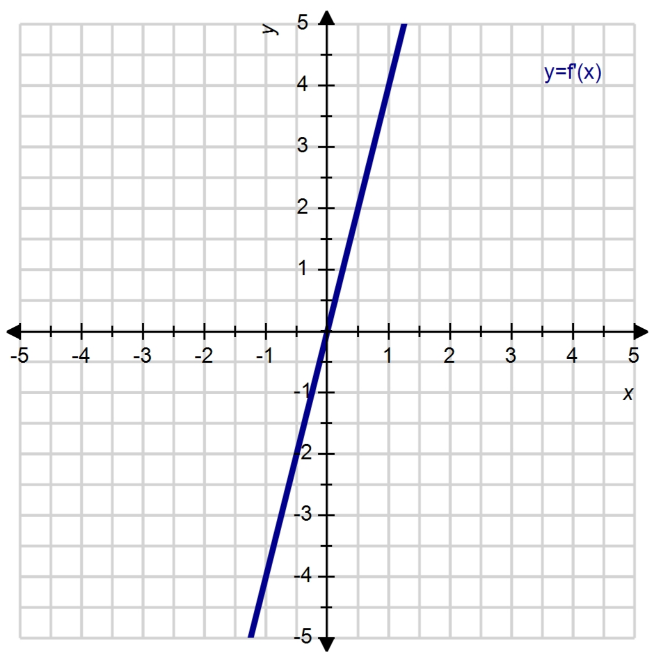
Assessment#2

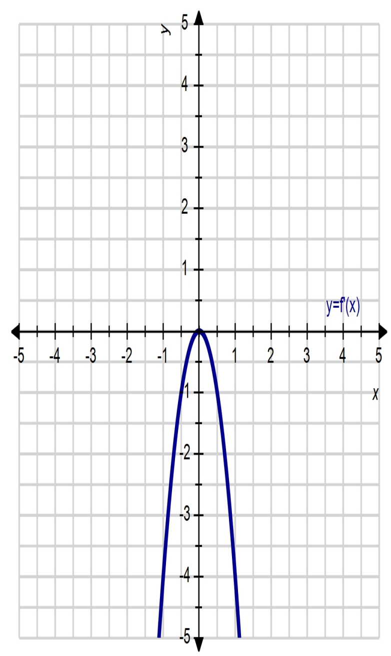




c.



d.



e.

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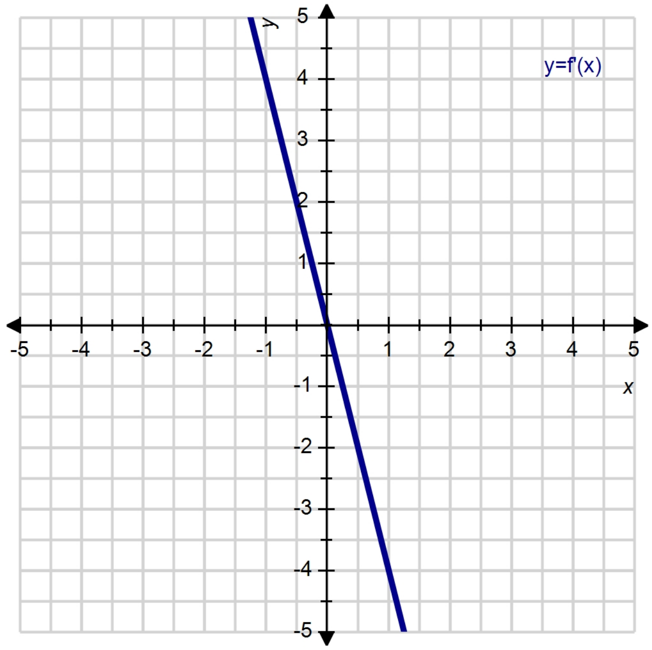
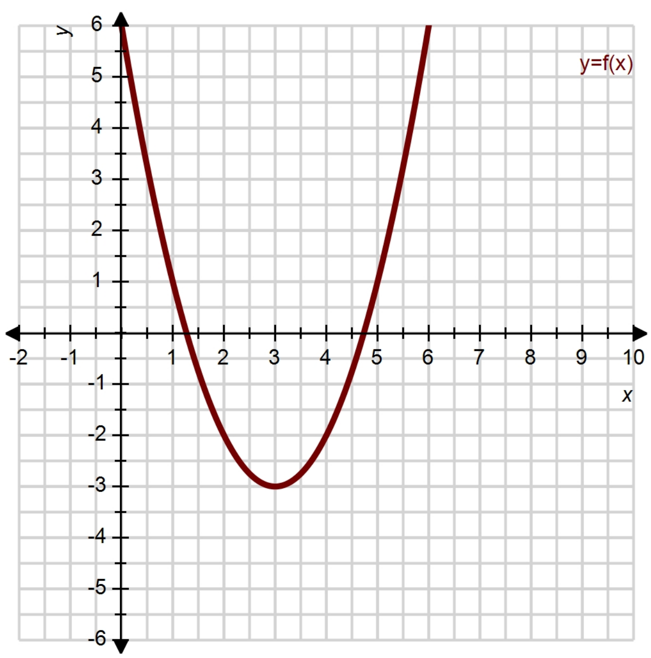
Assessment#2

b.



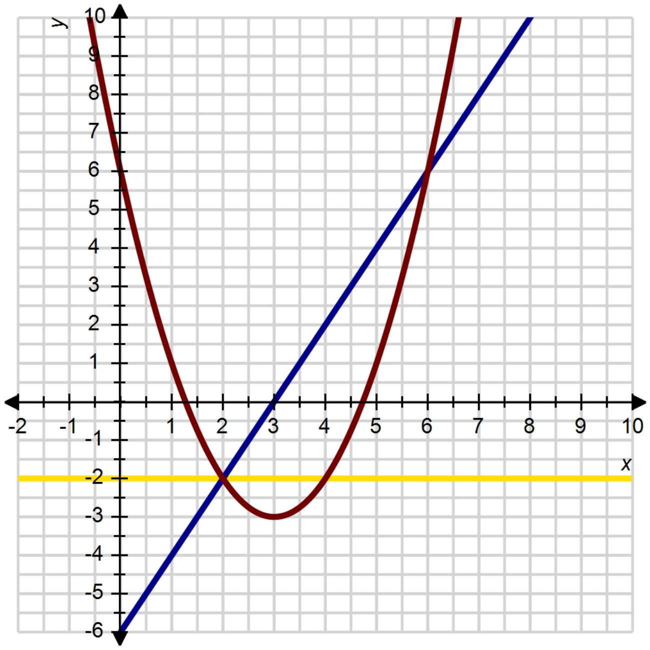
___ 7. The graph of f is shown. Graph f, f' and f'' on the same set of coordinate axes.

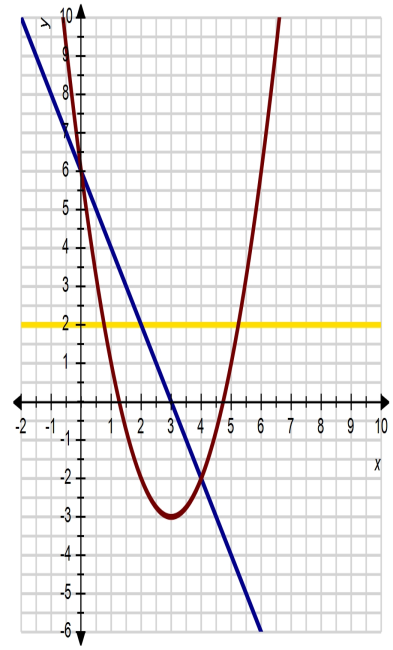


a.

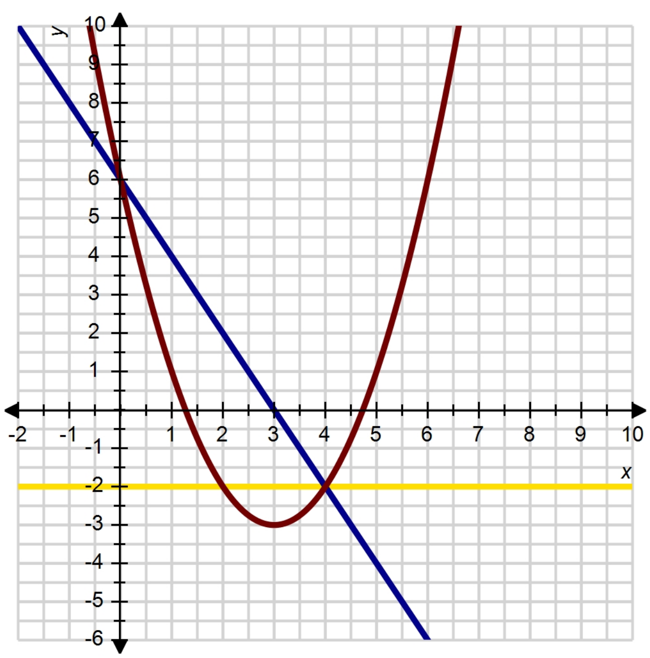
b.

Assessment#2

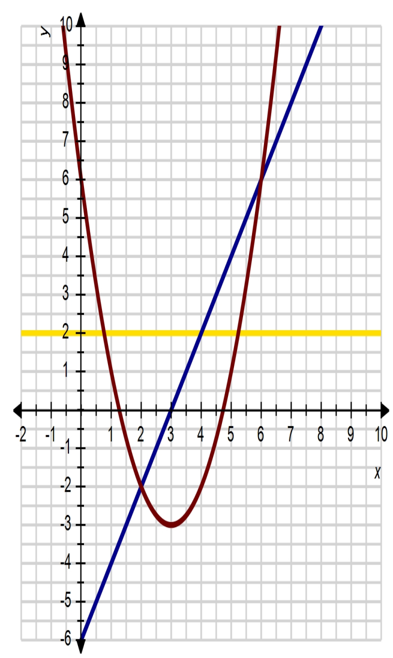




c.



d.



e. none of the above

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Assessment#2

___ 8. Locate the absolute extrema of the function $g(t) = \dfrac{t^2}{t^2 + 8}$ on the closed interval $[-6, 6]$.

a. The absolute maximum is $\dfrac{9}{11}$, and it occurs at the critical number $x = 0$.
The absolute minimum is 3, and it occurs at the left endpoint $x = -6$.

b. The absolute maximum is $\dfrac{9}{11}$, and it occurs at either endpoint $x = \pm 6$.
The absolute minimum is 0, and it occurs at the critical number $x = 0$.

c. The absolute maximum is $\dfrac{9}{11}$, and it occurs only at the left endpoint $x = -6$.
The absolute minimum is 0 and it occurs at the critical number $x = 0$.

d. The absolute maximum is $\dfrac{9}{11}$, and it occurs at the critical number $x = 0$.
The absolute minimum is 3, and it occurs at the right endpoint $x = 6$.

e. The absolute maximum is $\dfrac{9}{11}$, and it occurs only at the right endpoint $x = 6$
The absolute minimum is 0 and it occurs at the critical number $x = 0$.

___ 9. Find the critical number of the function $f(x) = -5x^2 + 90x + 7$.

a. $x = 18$
b. $x = 9$
c. $x = 70$
d. $x = 14$
e. $x = 7$

___ 10. Find the open interval(s) on which the function $f(x) = \cos^2(7x)$ is increasing in the interval $(0, 1.795)$. Round numerical values in your answer to three decimal places.

a. increasing on: $(0, 0.224), (0.449, 0.673), (0.898, 1.122), (1.346, 1.571)$
b. increasing on: $(0.449, 0.224), (0.449, 0.673), (0.898, 1.122), (1.346, 1.795)$
c. increasing on: $(0.224, 0.449), (0.673, 0.898), (1.122, 1.346), (1.571, 1.795)$
d. increasing on: $(0, 0.224), (0.549, 0.673), (0.898, 1.122), (1.446, 1.571)$
e. increasing on: $(0.449, 0.224), (0.449, 0.773), (0.898, 1.122), (1.446, 1.795)$

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Assessment#2

___ 11. Determine the open intervals on which the graph of the function $y = 4x - \tan 2x, \left(-\dfrac{\pi}{4}, \dfrac{\pi}{4}\right)$ is concave upward or concave downward.

a. concave upward: $\left(0, \dfrac{\pi}{4}\right)$; concave downward: $\left(-\dfrac{\pi}{4}, 0\right)$

b. concave upward: $\left(-\dfrac{\pi}{2}, -\dfrac{\pi}{8}\right), \left(\dfrac{\pi}{8}, \dfrac{\pi}{2}\right)$; concave downward: $\left(-\dfrac{\pi}{8}, \dfrac{\pi}{8}\right)$

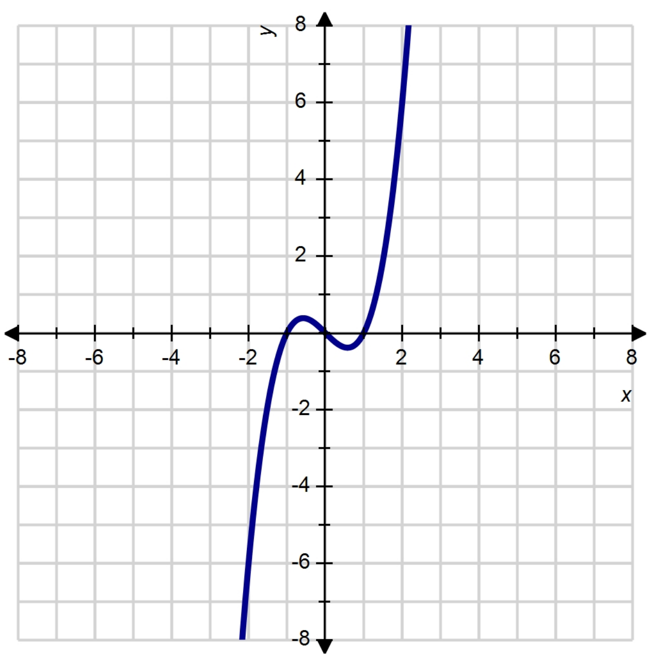
c. concave upward: $\left(-\dfrac{\pi}{2}, 1\right)$; concave downward: $\left(1, \dfrac{\pi}{2}\right)$

d. concave upward: $\left(-\dfrac{\pi}{8}, \dfrac{\pi}{8}\right)$; concave downward: $\left(-\dfrac{\pi}{2}, -\dfrac{\pi}{8}\right), \left(\dfrac{\pi}{8}, \dfrac{\pi}{2}\right)$

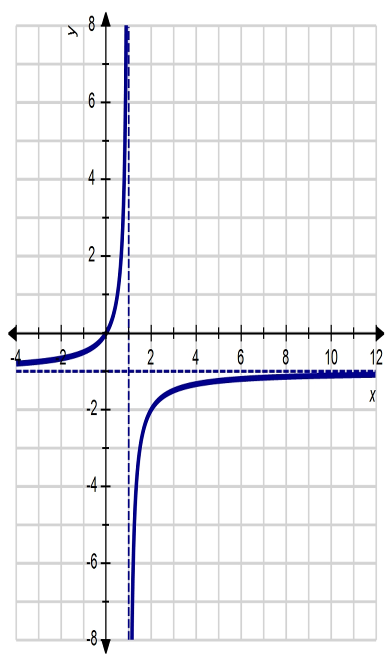
e. concave upward: $\left(-\dfrac{\pi}{4}, 0\right)$; concave downward: $\left(0, \dfrac{\pi}{4}\right)$

___ 12. Analyze and sketch a graph of the function $y = 2 - x - x^3$.

a.



b.



c.

d.

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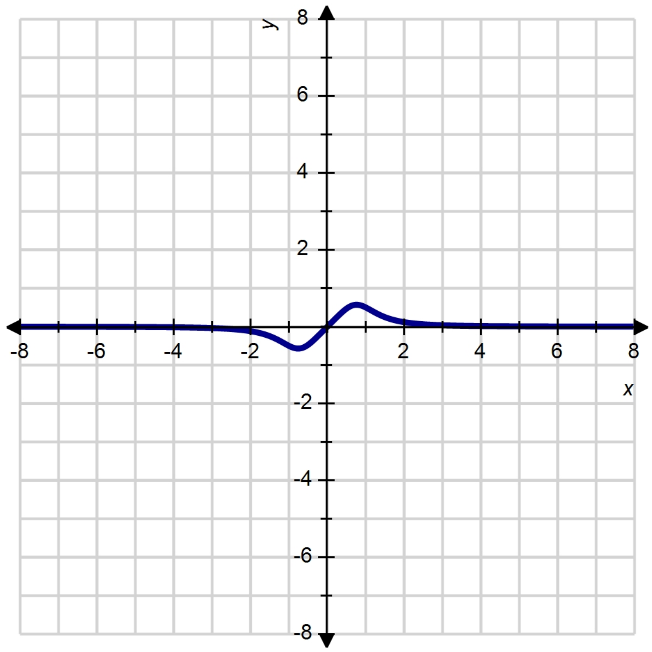
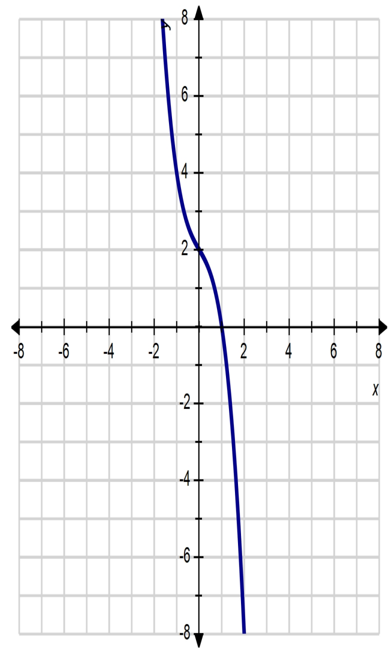
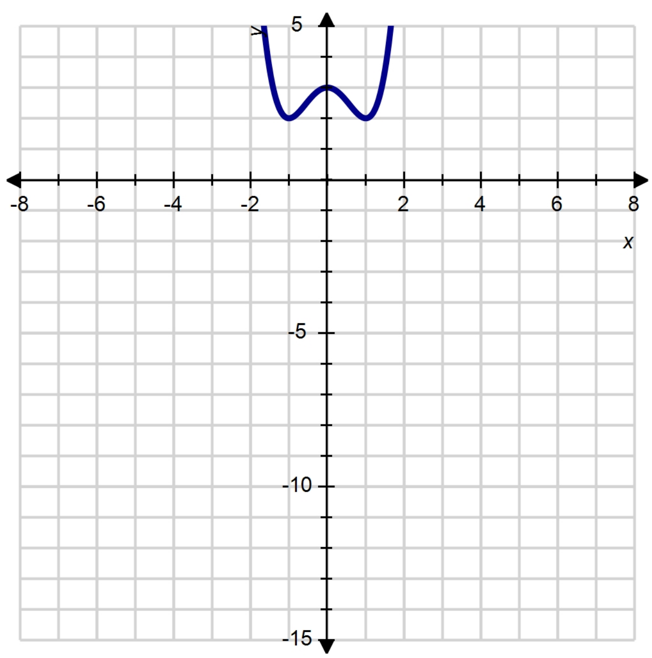
Assessment#2





e.



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Assessment#2

___ 13. The resistance R of a certain type of resistor is $R=\sqrt{0.001T^4-3T+600}$ where R is measured in ohms and the temperature T is measured in degrees Celsius. Use a computer algebra system to find $\frac{dR}{dT}$.

a. $\frac{dR}{dT}=\frac{\sqrt{0.004T^3-3}}{2\sqrt{0.001T^4-3T+600}}$

b. $\frac{dR}{dT}=\frac{\sqrt{0.004T^3-3}}{2\sqrt{0.001T^4-3}}$

c. $\frac{dR}{dT}=\frac{T^3}{500\sqrt{0.001T^4-3T+600}}$

d. $\frac{dR}{dT}=\frac{0.004T^4-3T}{2\sqrt{0.001T^4-3T+600}}$

e. $\frac{dR}{dT}=\frac{0.004T^3-3}{2\sqrt{0.001T^4-3T+600}}$

___ 14. Find all points of inflection, if any exist, of the graph of the function $f(x)=x\sqrt{x+24}$. Round your answers to two decimal places.

a. (48, 407.29)

b. (1, 5), (24, 166.28)

c. (1, 5), (2, 10.2)

d. (24, 166.28)

e. no points of inflection

___ 15. Analyze and sketch a graph of the function $y=x\sqrt{9-x}$.

a.

b.

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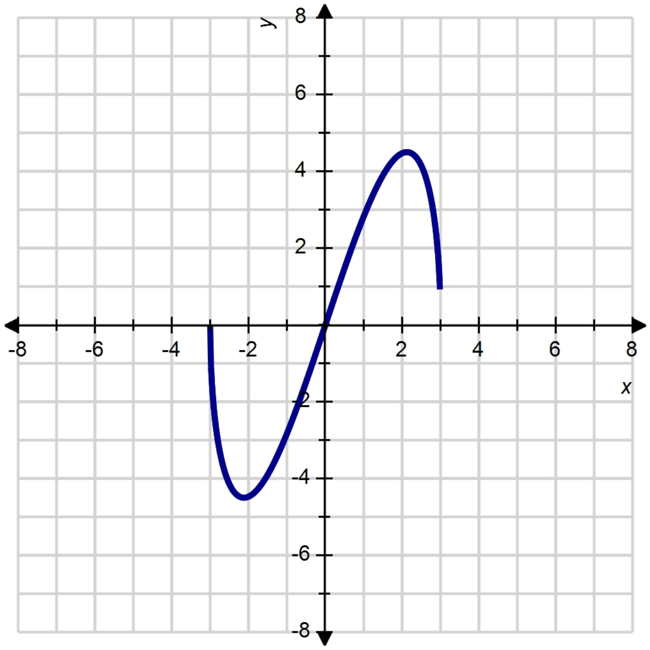
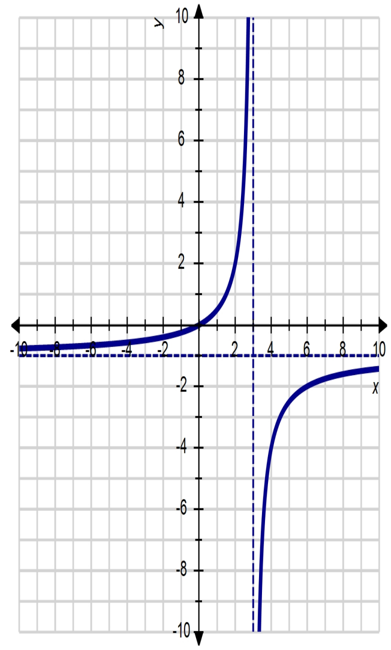
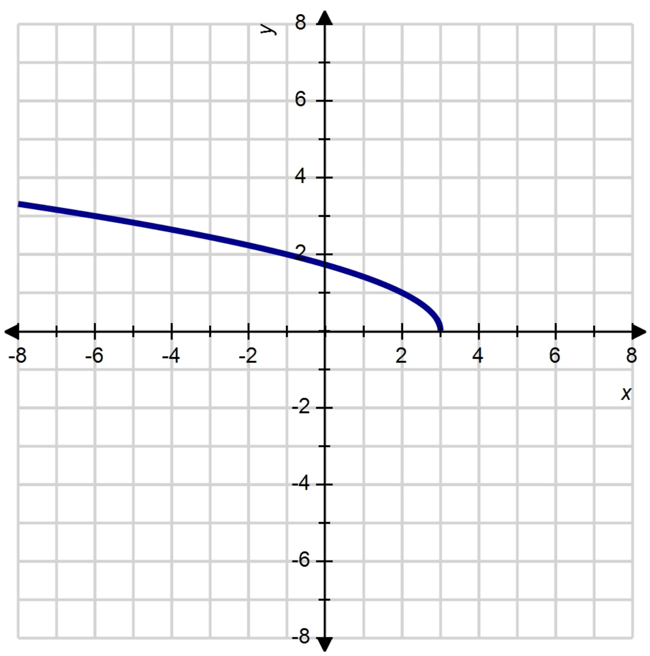
Assessment#2

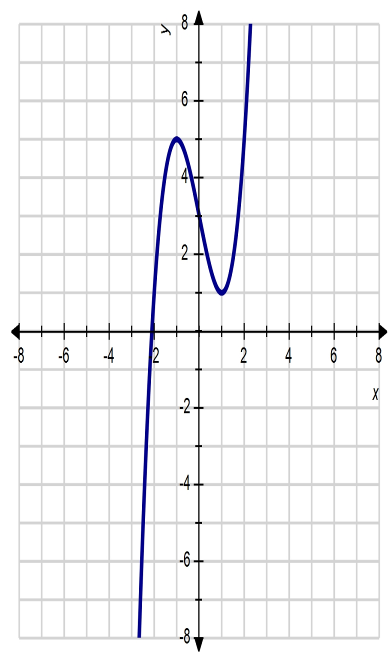




c.

d.





e.

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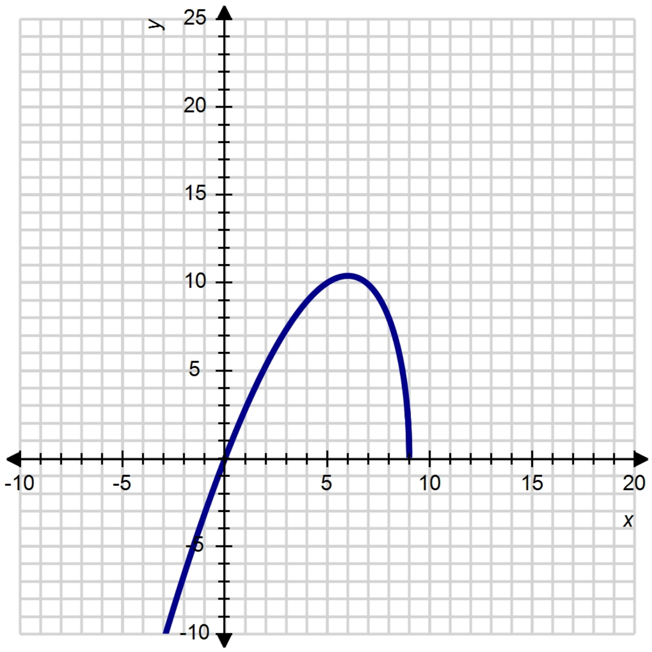
Assessment#2



___ 16. Use a graphing utility to graph the function $f(x) = \dfrac{12}{6-x}$ and locate the absolute extrema of the function on the interval $[0, 6)$.

a. absolute minimum: $(0, 0)$
no absolute maximum

b. absolute minimum: $(0, 2)$
no absolute maximum

c. absolute minimum: $(3, 4)$
no absolute maximum

d. absolute minimum: $(0, 2)$
absolute maximum: $(6, 12)$

e. absolute maximum: $(0, 2)$
absolute minimum: $(6, 0)$

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Assessment#2

___ 17. Find two positive numbers whose product is 195 and whose sum is a minimum.

a. $\sqrt{195}$, $\sqrt{195}$

b. $2\sqrt{195}$, $\dfrac{\sqrt{195}}{2}$

c. 0, 195

d. 1, 195

e. $3\sqrt{195}$, $\dfrac{\sqrt{195}}{3}$

___ 18. A ball bearing is placed on an inclined plane and begins to roll. The angle of elevation of the plane is θ radians. The distance (in meters) the ball bearing rolls in t seconds is $s(t) = 4.5(\sin\theta)t^2$. Determine the speed of the ball bearing after t seconds.

a. speed: $5.5(\sin\theta)t^2$ meters per second

b. speed: $(\sin\theta)t^2$ meters per second

c. speed: $9(\sin\theta)t$ meters per second

d. speed: $9(\cos\theta)t$ meters per second

e. speed: $4.5(\sin\theta)t^2$ meters per second

___ 19. Find all critical numbers of the function $g(x) = x^4 - 6x^2$.

a. critical numbers: $x = 0, x = \sqrt{6}, x = -\sqrt{6}$

b. critical numbers: $x = 0, x = \sqrt{3}, x = -\sqrt{3}$

c. critical numbers: $x = \sqrt{6}, x = -\sqrt{6}$

d. critical numbers: $x = \sqrt{3}, x = -\sqrt{3}$

e. no critical numbers

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Assessment#2

___ 20. For the function $f(x) = (x-1)^{\frac{10}{19}}$:

(a) Find the critical numbers of *f* (if any);
(b) Find the open intervals where the function is increasing or decreasing; and
(c) Apply the First Derivative Test to identify all relative extrema.

Use a graphing utility to confirm your results.

a. (a) $x = 0$
   (b) increasing: $(-\infty, 0)$; decreasing: $(0, \infty)$
   (c) relative max: $f(0) = 1$
b. (a) $x = 1$
   (b) increasing: $(-\infty, 1)$; decreasing: $(1, \infty)$
   (c) relative max: $f(1) = 0$
c. (a) $x = 1$
   (b) decreasing: $(-\infty, 1)$; increasing: $(1, \infty)$
   (c) relative min: $f(1) = 0$
d. (a) $x = 0.1$
   (b) decreasing: $(-\infty, 0) \cup (1, \infty)$; increasing: $(0, 1)$
   (c) relative min: $f(0) = 1$; relative max: $f(1) = 0$
e. (a) $x = 0$
   (b) decreasing: $(-\infty, 0)$; increasing: $(0, \infty)$
   (c) relative min: $f(0) = 1$

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Assessment#2

___ 21. Locate the absolute extrema of the function $f(x) = 7\sin(\pi x)$ on the closed interval $\left[0, \frac{1}{3}\right]$.

a. The absolute minimum is 0, and it occurs at the left endpoint $x = 0$.
The absolute maximum is $\frac{7\sqrt{3}}{2}$, and it occurs at the right endpoint $x = \frac{1}{3}$.

b. The absolute minimum is 0, and it occurs at the right endpoint $x = \frac{1}{3}$.
The absolute maximum is $\frac{7}{2}$, and it occurs at the left endpoint $x = 0$.

c. The absolute minimum is 0, and it occurs at the left endpoint $x = 0$.
The absolute maximum is $\frac{7}{2}$, and it occurs at the right endpoint $x = \frac{1}{3}$.

d. The absolute minimum is 0, and it occurs at the right endpoint $x = \frac{1}{3}$.
The absolute maximum is $\frac{7\sqrt{2}}{2}$ and it occurs at the left endpoint $x = 0$.

e. The absolute minimum is 0, and it occurs at the left endpoint $x = 0$.
The absolute maximum is $\frac{7\sqrt{2}}{2}$, and it occurs at the right endpoint $x = \frac{1}{3}$.

___ 22. Identify the open intervals where the function $f(x) = -3x^2 + 3x - 5$ is increasing or decreasing.

a. decreasing on $(-\infty, \infty)$
b. increasing on $(-\infty, \infty)$
c. decreasing on $\left(-\infty, \frac{1}{2}\right)$; increasing on $\left(\frac{1}{2}, \infty\right)$
d. decreasing on $(-\infty, 0)$; increasing on $(0, \infty)$
e. increasing on $\left(-\infty, \frac{1}{2}\right)$; decreasing on $\left(\frac{1}{2}, \infty\right)$

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Assessment#2

___ 23. Locate the absolute extrema of the given function on the closed interval $[-50, 50]$.

$$f(x) = \frac{50x}{x^2 + 25}$$

a. absolute max: $(0, 0)$; absolute min $(-5, -5)$

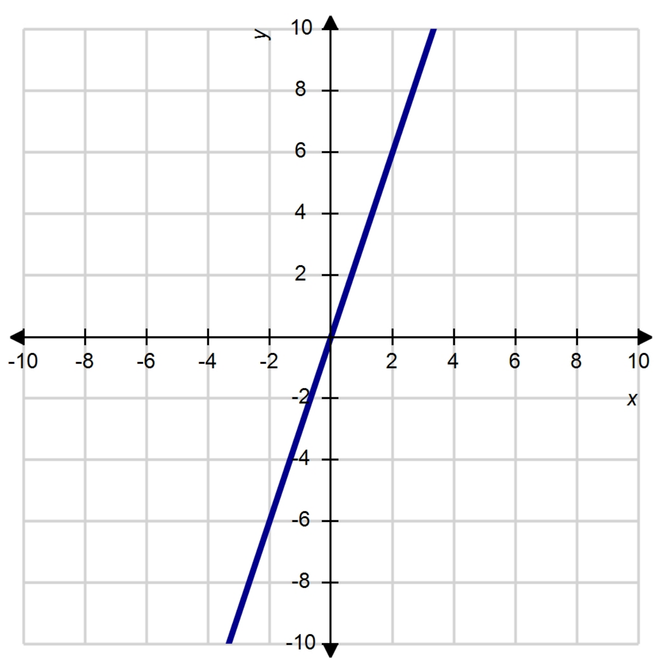
b. absolute max: $(5, 5)$; absolute min $(0, 0)$

c. absolute max: $(5, 5)$; absolute min $(-5, -5)$

d. absolute max: $(5, 5)$; no absolute min

e. no absolute max; absolute min: $(-5, -5)$

___ 24. The graph of a function f is shown below.



Sketch the graph of the derivative f'.

a.

b.

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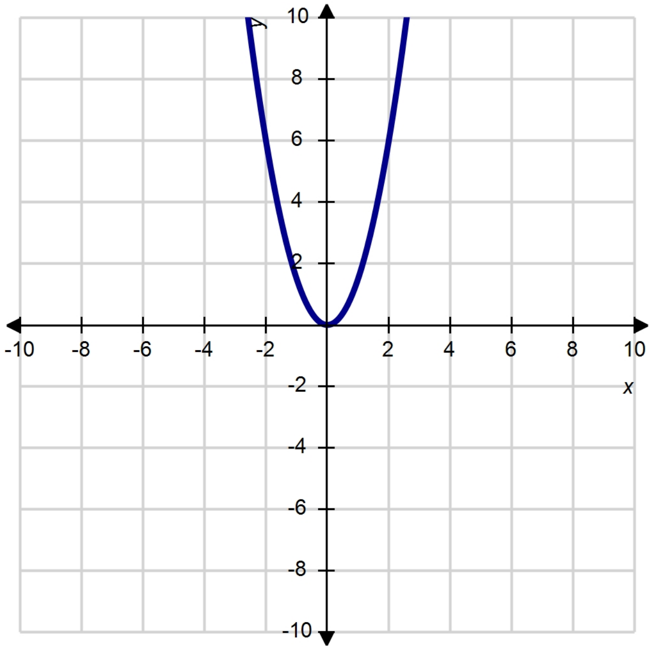
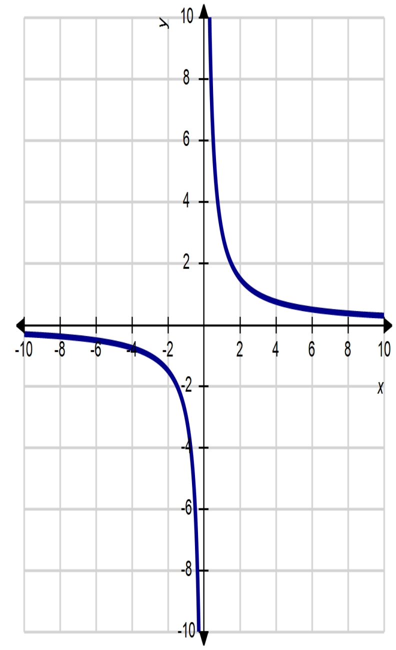
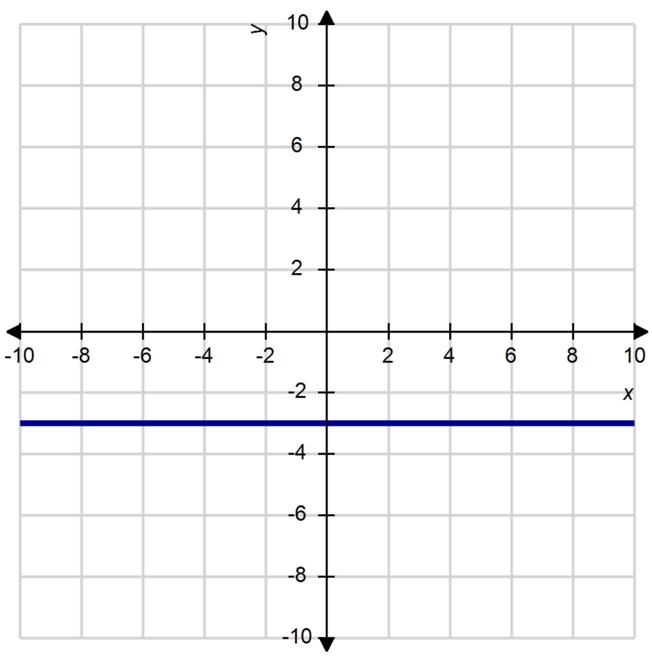
Assessment#2

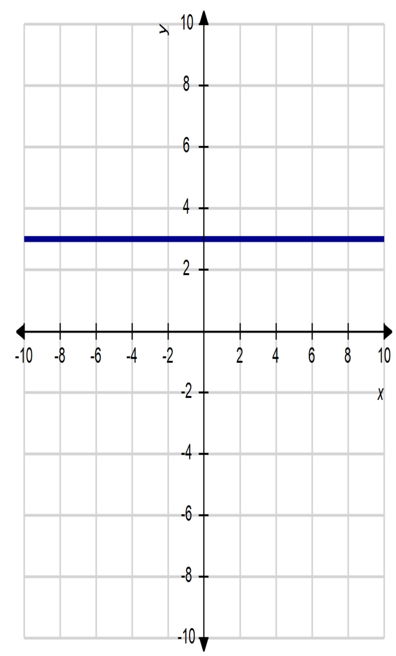




c.

d.





e.

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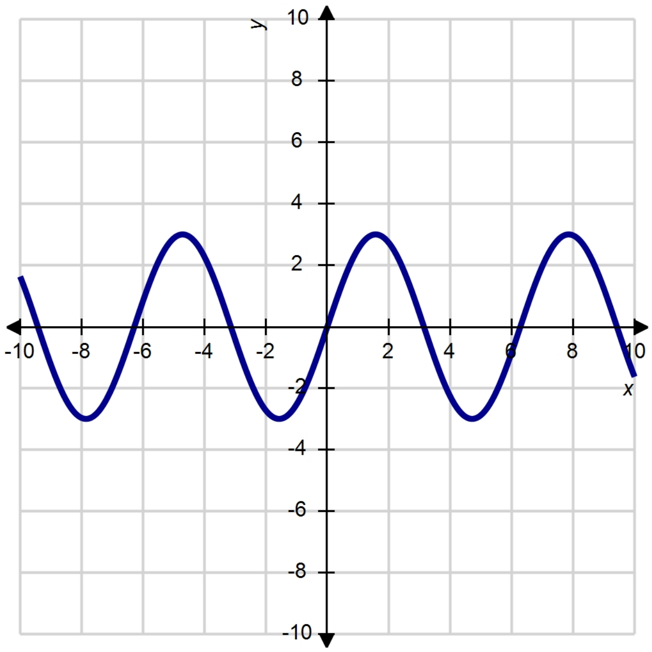
Assessment#2



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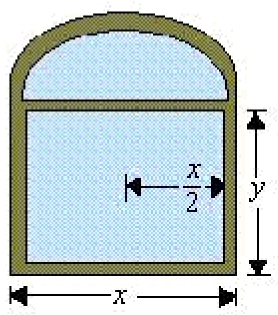
Assessment#2

___ 25. A Norman window is constructed by adjoining a semicircle to the top of an ordinary rectangular window (see the figure below). Find the dimensions of a Norman window of maximum area if the total perimeter is 22 feet.



a. $x = \dfrac{44}{2+\pi}$ feet; $y = \dfrac{22}{2+\pi}$ feet;

b. $x = \dfrac{66}{2+\pi}$ feet; $y = \dfrac{22}{2+\pi}$ feet;

c. $x = \dfrac{22}{4+\pi}$ feet; $y = \dfrac{44}{4+\pi}$ feet;

d. $x = \dfrac{44}{4+\pi}$ feet; $y = \dfrac{22}{4+\pi}$ feet;

e. $x = \dfrac{22}{4+\pi}$ feet; $y = \dfrac{66}{4+\pi}$ feet;

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Assessment#2

___ 26. Find the points of inflection and discuss the concavity of the function $f(x) = -5x - 3\cos x$ on the interval $[0, 2\pi]$.

a. concave down on $(0, 2\pi)$; no points of inflection

b. concave downward on $\left(\frac{\pi}{2}, \frac{3\pi}{2}\right)$; concave upward on $\left(0, \frac{\pi}{2}\right), \left(\frac{3\pi}{2}, 2\pi\right)$; inflection points at $x = \frac{\pi}{2}$ and $x = \frac{3\pi}{2}$

c. concave upward on $\left(\frac{\pi}{2}, \frac{3\pi}{2}\right)$; concave downward on $\left(0, \frac{\pi}{2}\right), \left(\frac{3\pi}{2}, 2\pi\right)$; inflection points at $x = \frac{\pi}{2}$ and $x = \frac{3\pi}{2}$

d. concave up on $(0, 2\pi)$; no points of inflection

e. none of the above

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Assessment#2

___ 27. Determine the open intervals on which the graph of $f(x) = 7x + \cos x$ is concave downward or concave upward.

a. concave downward on $\ldots, \left(-\frac{3\pi}{2}, -\frac{\pi}{2}\right), \left(\frac{\pi}{2}, \frac{3\pi}{2}\right), \left(\frac{5\pi}{2}, \frac{7\pi}{2}\right), \ldots;$

concave upward on $\ldots, \left(-\frac{5\pi}{2}, -\frac{3\pi}{2}\right), \left(-\frac{\pi}{2}, \frac{\pi}{2}\right), \left(\frac{3\pi}{2}, \frac{5\pi}{2}\right), \ldots$

b. concave downward on $\ldots, \left(-\frac{3\pi}{4}, -\frac{\pi}{4}\right), \left(\frac{\pi}{4}, \frac{3\pi}{4}\right), \left(\frac{5\pi}{4}, \frac{7\pi}{4}\right), \ldots;$

concave upward on $\ldots, \left(-\frac{5\pi}{4}, -\frac{3\pi}{4}\right), \left(-\frac{\pi}{4}, \frac{\pi}{4}\right), \left(\frac{3\pi}{4}, \frac{5\pi}{4}\right), \ldots$

c. concave upward on $\ldots, \left(-\frac{3\pi}{4}, -\frac{\pi}{4}\right), \left(\frac{\pi}{4}, \frac{3\pi}{4}\right), \left(\frac{5\pi}{4}, \frac{7\pi}{4}\right), \ldots;$

concave downward on $\ldots, \left(-\frac{5\pi}{4}, -\frac{3\pi}{4}\right), \left(-\frac{\pi}{4}, \frac{\pi}{4}\right), \left(\frac{3\pi}{4}, \frac{5\pi}{4}\right), \ldots$

d. concave downward on $\ldots, \left(-\frac{3\pi}{6}, -\frac{\pi}{6}\right), \left(\frac{\pi}{6}, \frac{3\pi}{6}\right), \left(\frac{5\pi}{6}, \frac{7\pi}{6}\right), \ldots;$

concave upward on $\ldots, \left(-\frac{5\pi}{6}, -\frac{3\pi}{6}\right), \left(-\frac{\pi}{6}, \frac{\pi}{6}\right), \left(\frac{3\pi}{6}, \frac{5\pi}{6}\right), \ldots$

e. concave upward on $\ldots, \left(-\frac{3\pi}{2}, -\frac{\pi}{2}\right), \left(\frac{\pi}{2}, \frac{3\pi}{2}\right), \left(\frac{5\pi}{2}, \frac{7\pi}{2}\right), \ldots;$

concave downward on $\ldots, \left(-\frac{5\pi}{2}, -\frac{3\pi}{2}\right), \left(-\frac{\pi}{2}, \frac{\pi}{2}\right), \left(\frac{3\pi}{2}, \frac{5\pi}{2}\right), \ldots$

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Assessment#2

___ 28. Determine the open intervals on which the graph of the function $f(x)=\dfrac{x^2}{x^2+121}$ is concave upward or concave downward.

a. concave upward: $\left(-\infty, -\frac{11\sqrt{3}}{3}\right), \left(\frac{11\sqrt{3}}{3}, \infty\right)$; concave downward: $\left(-\frac{11\sqrt{3}}{3}, \frac{11\sqrt{3}}{3}\right)$

b. concave upward: $\left(-\frac{11\sqrt{3}}{3}, \frac{11\sqrt{3}}{3}\right)$; concave downward: $\left(-\infty, -\frac{11\sqrt{3}}{3}\right), \left(\frac{11\sqrt{3}}{3}, \infty\right)$

c. concave upward: $(-\infty, 0)$; concave downward: $(0, \infty)$

d. concave upward: $\left(-\frac{121}{3}, \frac{121}{3}\right)$; concave downward: $\left(-\infty, -\frac{121}{3}\right), \left(\frac{121}{3}, \infty\right)$

e. concave upward: $\left(-\infty, -\frac{121}{3}\right), \left(\frac{121}{3}, \infty\right)$; concave downward: $\left(-\frac{121}{3}, \frac{121}{3}\right)$

___ 29. For the function $f(x)=2x^3-12x^2+3$:

(a) Find the critical numbers of *f* (if any);
(b) Find the open intervals where the function is increasing or decreasing; and
(c) Apply the First Derivative Test to identify all relative extrema.

Then use a graphing utility to confirm your results.

a. (a) $x=0, 1$
(b) increasing: $(-\infty, 0)\cup(1, \infty)$; decreasing: $(0, 1)$
(c) relative max: $f(0)=3$; relative min: $f(1)=-7$

b. (a) $x=0, 1$
(b) decreasing: $(-\infty, 0)\cup(1, \infty)$; increasing: $(0, 1)$
(c) relative min: $f(0)=3$; relative max: $f(1)=-7$

c. (a) $x=0, 1$
(b) increasing: $(-\infty, 0)\cup(1, \infty)$; decreasing: $(0, 1)$
(c) relative max: $f(0)=3$; no relative min.

d. (a) $x=0, 4$
(b) increasing: $(-\infty, 0)\cup(4, \infty)$; decreasing: $(0, 4)$
(c) relative max: $f(0)=3$; relative min: $f(4)=-61$

e. (a) $x=0, 4$
(b) decreasing: $(-\infty, 0)\cup(4, \infty)$; increasing: $(0, 4)$
(c) relative min: $f(0)=3$; relative max: $f(4)=-61$

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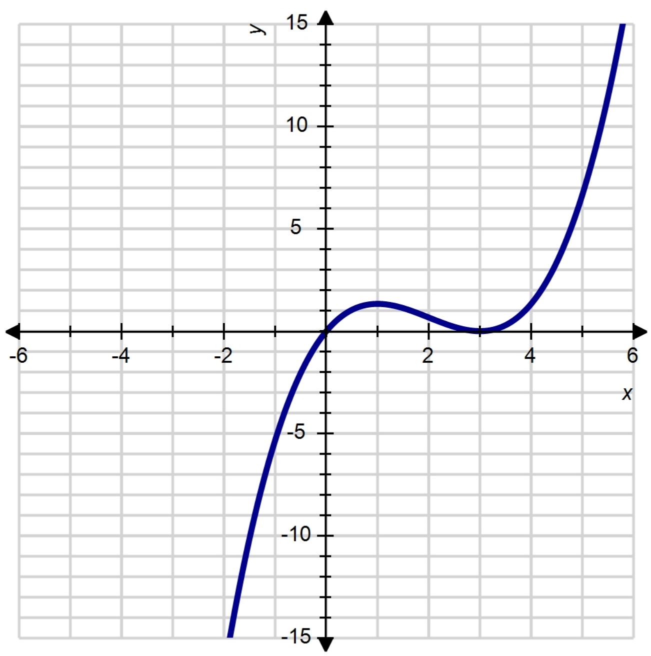
Assessment#2

___ 30. Find the points of inflection and discuss the concavity of the function $f(x) = x\sqrt{x+16}$.

a. no inflection points; concave up on $(-16, \infty)$
b. no inflection points; concave down on $(-16, \infty)$
c. inflection point at $x = 16$; concave up on $(-16, \infty)$
d. inflection point at $x = 0$; concave up on $(-16, 0)$; concave down on $(0, \infty)$
e. inflection point at $x = 16$; concave down on $(-16, \infty)$

___ 31. The graph of *f* is shown below. On what interval is $f'(x)$ an increasing function?



a. $(6, \infty)$
b. $(3, \infty)$
c. $(-2, \infty)$
d. $(1, \infty)$
e. $(2, \infty)$

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Assessment#2

___ 32. Find the points of inflection and discuss the concavity of the function.

$y = 5x^3 - 8x^2 - 6x - 8$

a. inflection point at $x = -\frac{8}{15}$; concave downward on $\left(-\infty, -\frac{8}{15}\right)$; concave upward on $\left(-\frac{8}{15}, \infty\right)$

b. inflection point at $x = \frac{4}{15}$; concave upward on $\left(-\infty, \frac{4}{15}\right)$; concave downward on $\left(\frac{4}{15}, \infty\right)$

c. inflection point at $x = \frac{8}{15}$; concave upward on $\left(-\infty, \frac{8}{15}\right)$; concave downward on $\left(\frac{8}{15}, \infty\right)$

d. inflection point at $x = -\frac{8}{15}$; concave upward on $\left(-\infty, -\frac{8}{15}\right)$; concave downward on $\left(-\frac{8}{15}, \infty\right)$

e. inflection point at $x = \frac{8}{15}$; concave downward on $\left(-\infty, \frac{8}{15}\right)$; concave upward on $\left(\frac{8}{15}, \infty\right)$

___ 33. Find all relative extrema of the function $f(x) = x^{\frac{8}{11}} + 5$. Use the Second Derivative Test where applicable.

a. relative max: $(1, 6)$; no relative min

b. no relative max or min

c. relative min: $(0, 5)$; no relative max

d. relative max: $(1, 6)$; relative min: $(0, 5)$

e. relative max: $(0, 5)$; no relative min

___ 34. The graph of a function *f* is shown below. Sketch the graph of the derivative f'.

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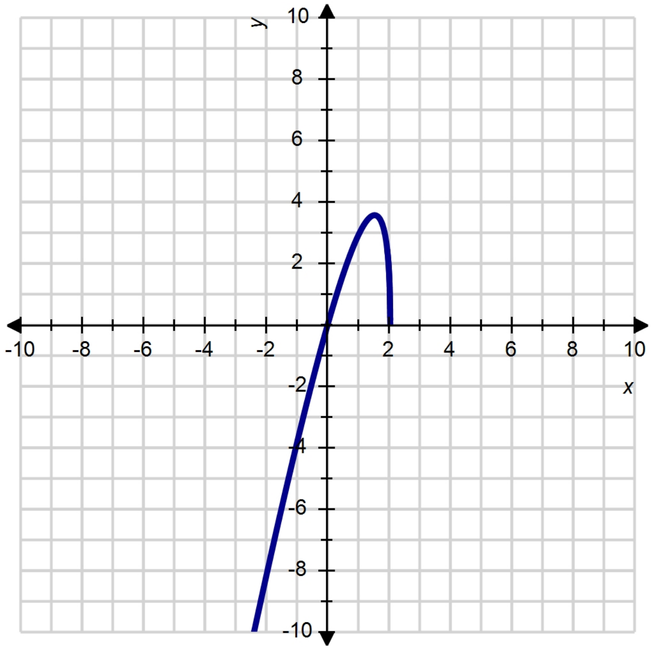
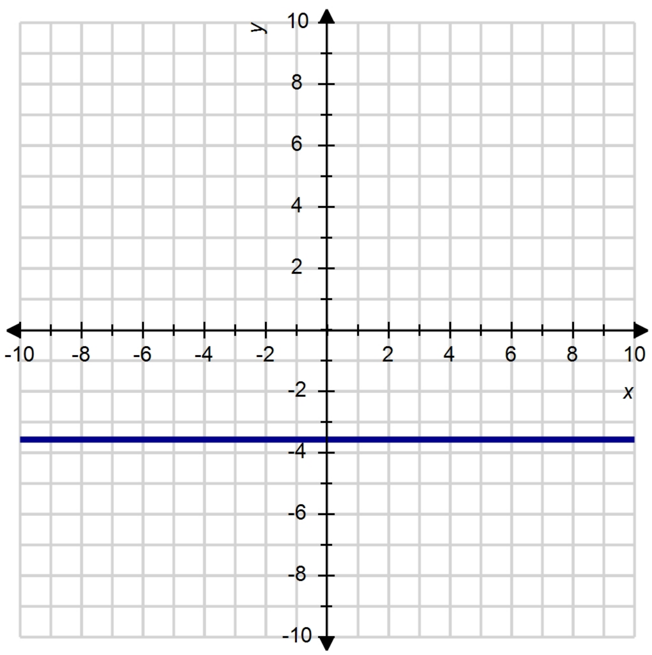
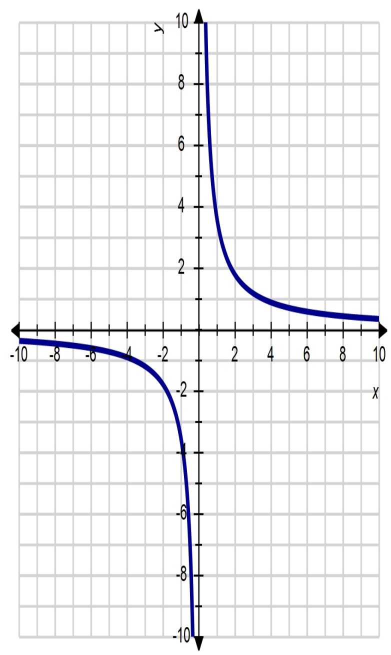
Assessment#2



a.

b.

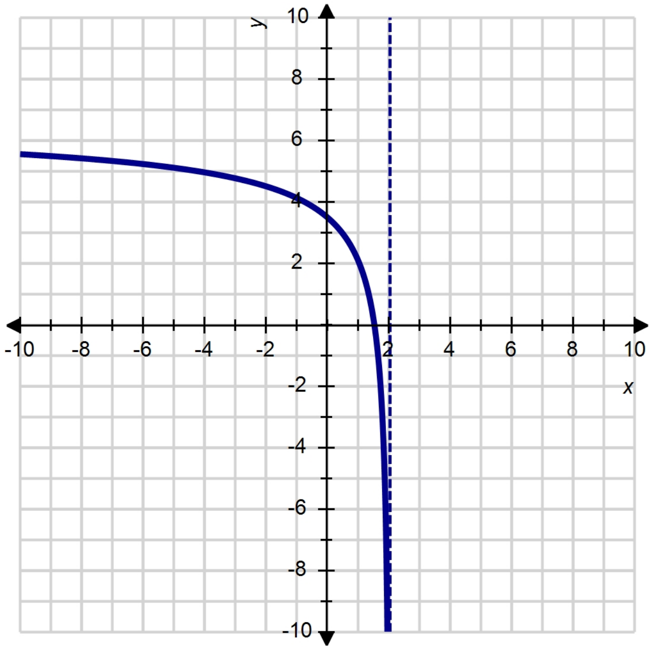


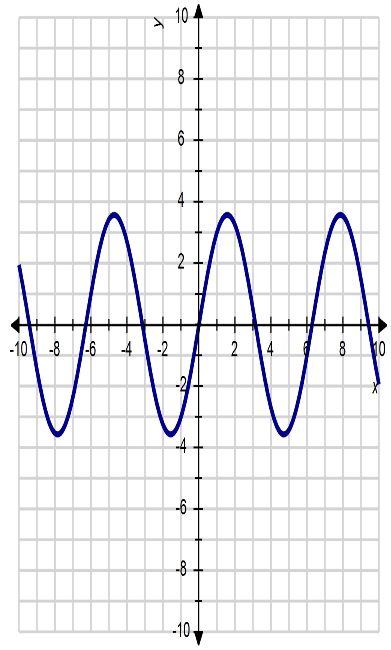


c.

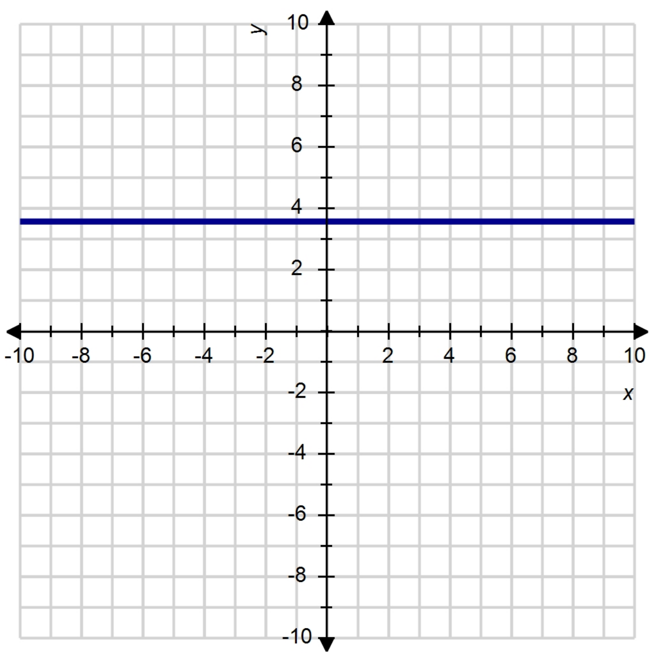
d.

Assessment#2





e.



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Assessment#2

___ 35. Find the relative maxima of $f(x) = \cos^2(7x)$ on the interval $(0,\ 1.795)$ by applying the First Derivative Test. Round numerical values in your answer to three decimal places.

a. relative maxima: $(0.898,\ 1),\ (1.122,\ 1),\ (1.346,\ 11.795)$
b. relative maxima: $(0.224,\ 0),\ (0.673,\ 0),\ (1.122,\ 0),\ (1.571,\ 0)$
c. relative maxima: $(0.449,\ 1),\ (0.898,\ 1),\ (1.346,\ 1)$
d. relative maxima: $(0.224,\ 1),\ (0.673,\ 1),\ (1.122,\ 1),\ (1.571,\ 1)$
e. relative maxima: $(0.224,\ 1),\ (0.449,\ 1),\ (0.673,\ 1)$

___ 36. Use a computer algebra system to graph the function $\frac{1}{12}x\sqrt{12-x}$ and determine all absolute extrema on the closed interval $[0,\ 12]$.

a. absolute maximum: $\left(8,\ \frac{4}{3}\right)$
absolute minimum: $(0,\ 0),\ (12,\ 0)$
b. absolute maximum: $\left(4,\ \frac{2}{3}\right)$
absolute minimum: $(0,\ 0),\ (12,\ 0)$
c. absolute maximum: $(12,\ 1)$
absolute minimum: $(0,\ 0)$
d. absolute maximum: $(12,\ 1)$
absolute minimum: $(0,\ 12)$
e. absolute maximum: $\left(8,\ \frac{4}{3}\right)$
absolute minimum: $(0,\ 12)$

___ 37. Find all points of inflection on the graph of the function $f(x) = \frac{1}{2}x^4 + 6x^3$.

a. $(-6,\ -648)$
b. $(0,\ 0)$
c. $(0,\ 0),\ (-4,\ -256)$
d. $(0,\ 0),\ (-6,\ -648)$
e. $(-2,\ -40)$

___ 38. Analyze and sketch a graph of the function $f(x) = \frac{x}{1+x^2}$.

a.

b.

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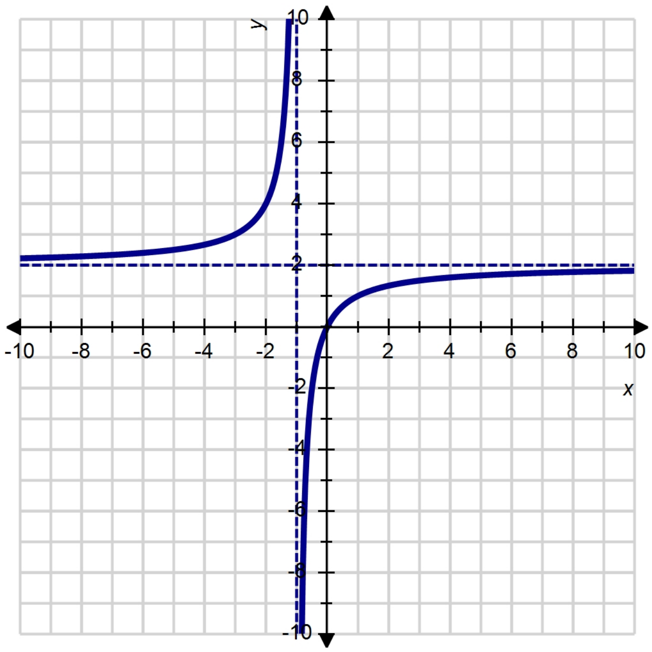
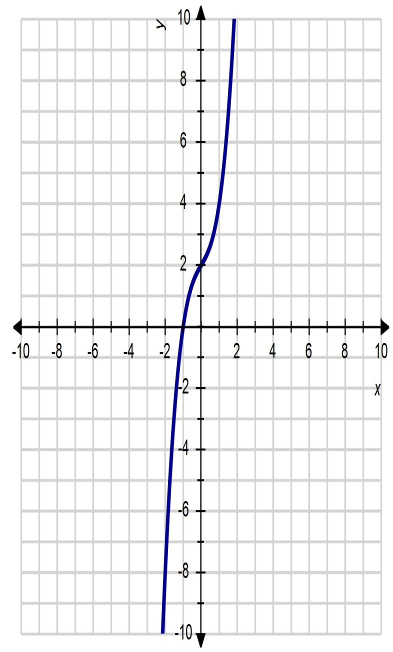
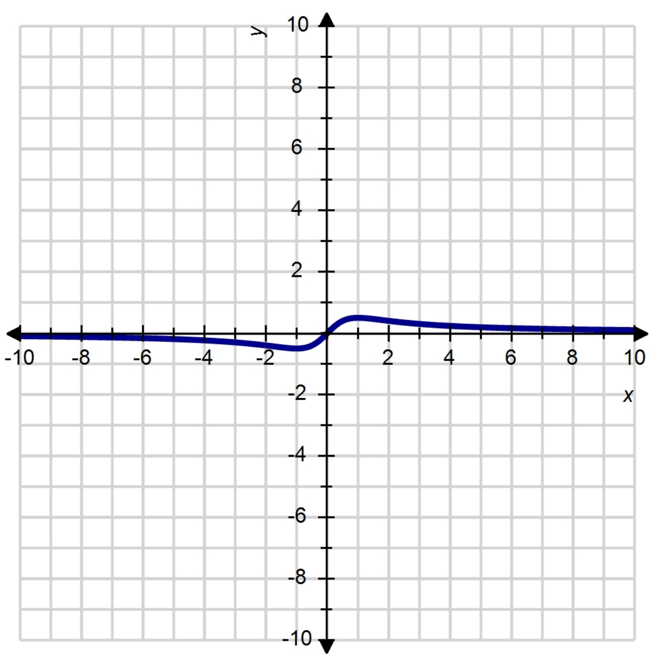
Assessment#2

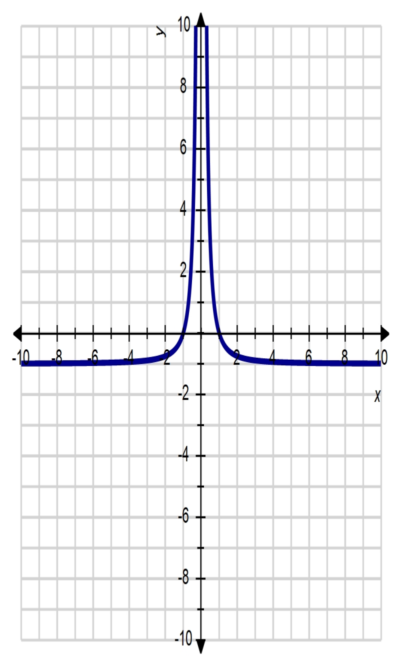




c.

d.





e.

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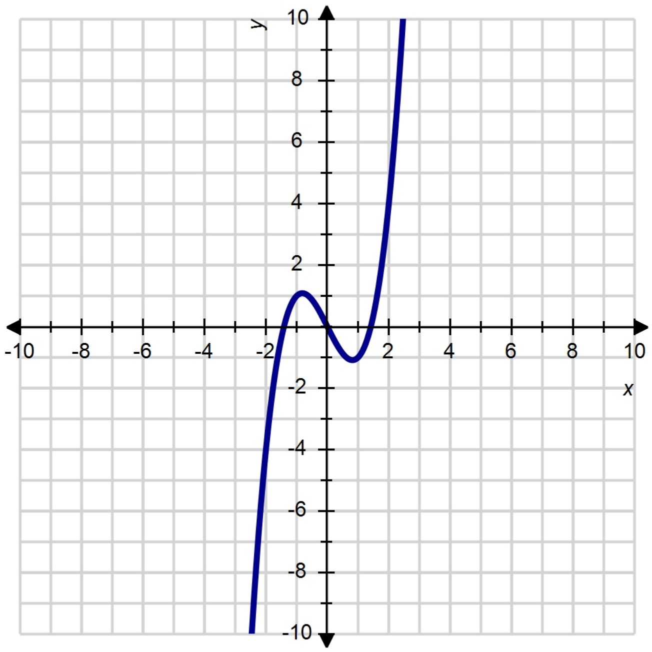
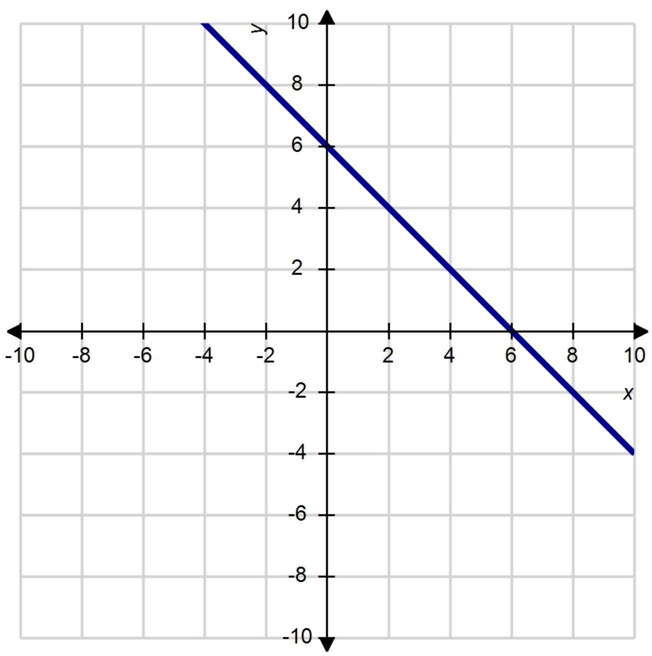
Assessment#2



___ 39. Use the following graph of f' to sketch a graph of f.



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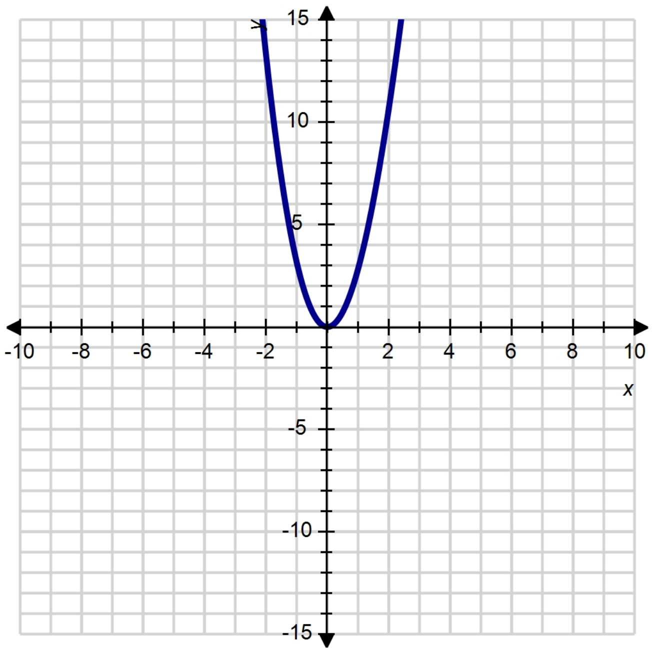
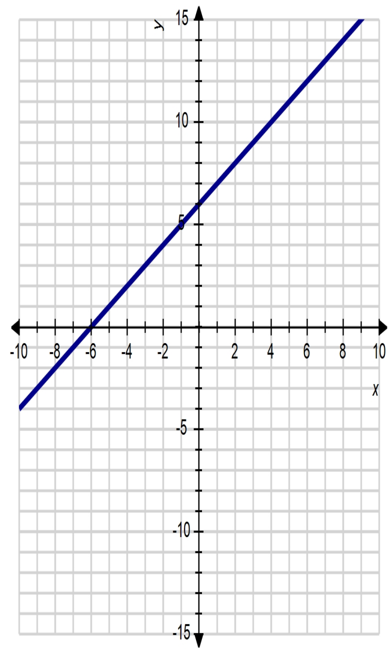
Assessment#2

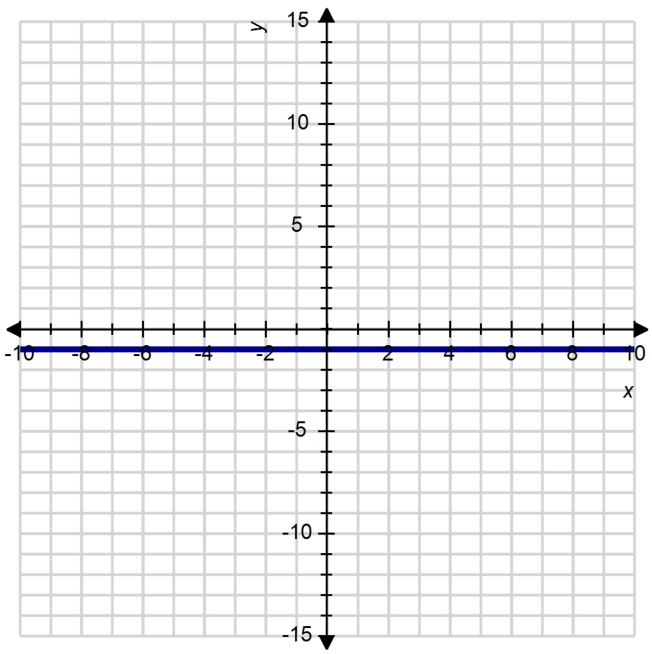
a.



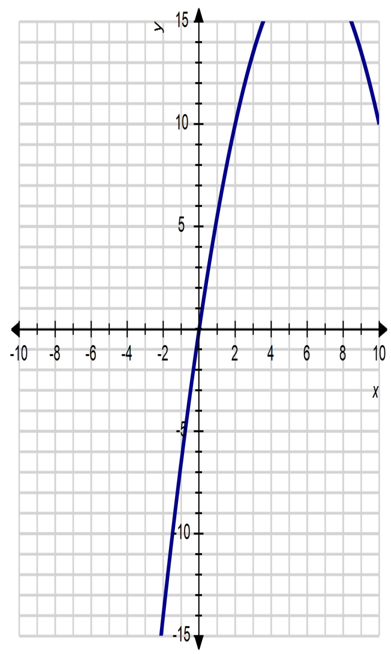
b.



c.



d.



e.

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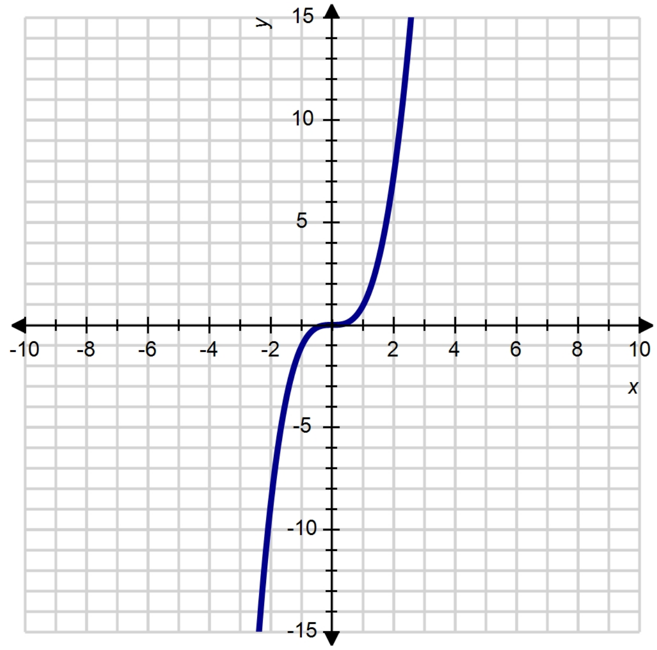
Assessment#2



___ 40. Find all relative extrema of the function $f(x)=x^{\frac{4}{5}}-8$. Use the Second Derivative Test where applicable.

a. relative minimum: $(0,\ -8)$
b. relative minimum: $(0, -7)$
c. relative maximum: $(0,\ -8)$
d. relative minimum: $(0,\ 4)$
e. relative maximum: $(0,\ 7)$