**1.**(1 pt) The domain of the function $f(x) = \frac{24}{2x-28}$ is all real numbers $x$ except for $x$ where $x$ equals ______

**2.**(1 pt) The domain of the function $f(x) = \sqrt{-2x+29}$ consists of one or more of the following intervals: $(-\infty, A]$ and $[A, \infty)$.

Find $A$ ______

For each interval, answer YES or NO to whether the interval is included in the solution.

$(-\infty, A)$ ______

$(A, \infty)$ ______

**3.**(1 pt) The domain of the function $f(x) = \sqrt{2x-58}$ is all real numbers in the interval $[A, \infty)$ where $A$ equals ______

**4.**(1 pt) The domain of the function $f(x) = \sqrt{x^2 - 12x + 32}$ consists of one or more of the following intervals: $(-\infty, A]$, $[A, B]$ and $[B, \infty)$ where $A < B$.

Find $A$ ______

Find $B$ ______

For each interval, answer YES or NO to whether the interval is included in the solution.

$(-\infty, A]$ ______

$[A, B]$ ______

$[B, \infty)$ ______

**5.**(1 pt) The domain of the function $f(x) = \sqrt{18 + 3x - x^2}$ is the closed interval $[A, B]$ where $A$ equals ______
and where $B$ equals ______

**6.**(1 pt) The domain of the function $f(x) = \sqrt{12 + 4x - x^2}$ is the closed interval $[A, B]$ where $A$ equals ______
and where $B$ equals ______

**7.**(1 pt) For each of the following functions, decide whether it is even, odd, or neither. Enter E for an EVEN function, O for an ODD function and N for a function which is NEITHER even nor odd.

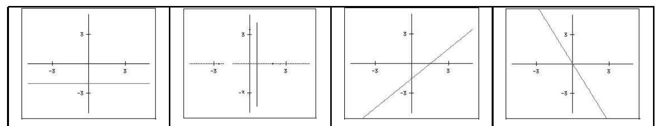
NOTE: You will only have four attempts to get this problem right!

__ 1. $f(x) = x^6 - 6x^{10} + 3x^4$
__ 2. $f(x) = x^3 + x^9 + x^3$
__ 3. $f(x) = -5x^6 - 3x^{10} - 2$
__ 4. $f(x) = x^6 + 3x^{10} + 2x^3$

**8.**(1 pt) The simplest functions are the linear (or affine) functions — the functions whose graphs are a straight line. They are important because many functions (the so-called differentiable functions) "locally" look like straight lines. ("locally" means that if we zoom in and look at the function at very powerful magnification it will look like a straight line.)

Enter the letter of the graph of the function which corresponds to each statement.

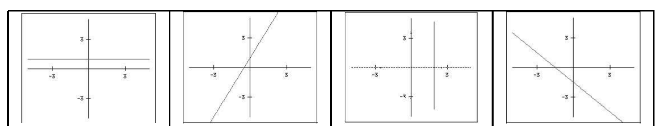
__ 1. The graph of the line is increasing
__ 2. The graph of the line is decreasing
__ 3. The graph of the line is constant
__ 4. The graph of the line is not the graph of a function



| A | B | C | D |
|---|---|---|---|

**9.**(1 pt) Enter the letter of the graph of the function which corresponds to each statement.

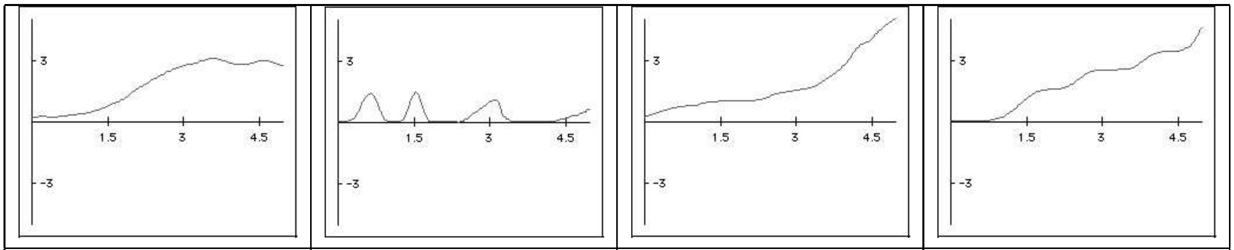
__ 1. The graph of the line is decreasing
__ 2. The graph of the line is increasing
__ 3. The graph of the line is not the graph of a function
__ 4. The graph of the line is constant



| A | B | C | D |
|---|---|---|---|

**10.**(1 pt) Almost any kind of quantitative data can be represented by a graph and most of these graphs represent functions. This is why functions and graphs are the objects analyzed by calculus. The next two problems illustrate data which can be represented by a graph. Match the following descriptions with their graphs below:

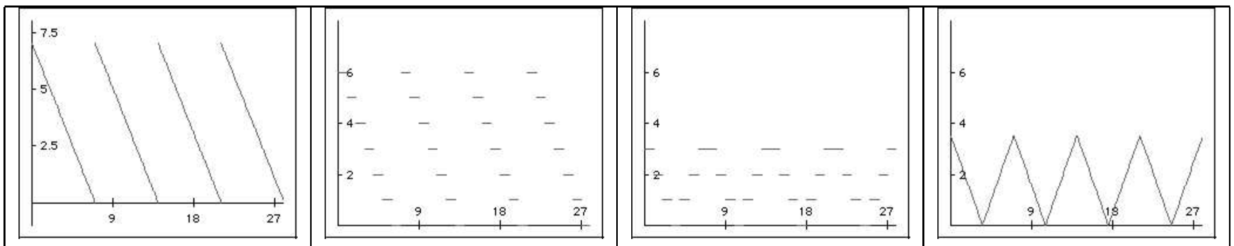
__ 1. The graph of the distance traveled by a car as it drives along a city street vs. time.
__ 2. The graph of the distance traveled by a car as it enters a superhighway vs. time.
__ 3. The graph of the velocity of a car entering a superhighway vs. time.
__ 4. The graph of the velocity of a car as it drives along a city street vs. time.



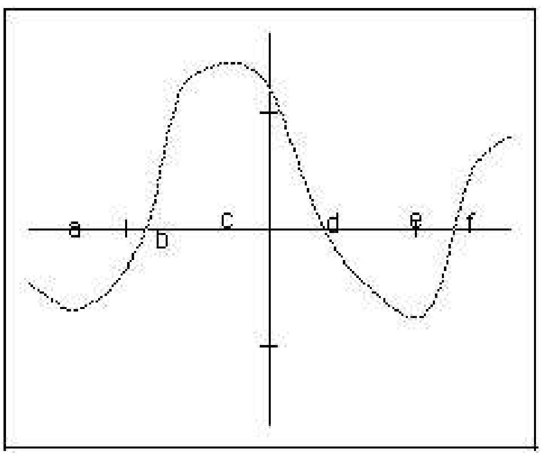

| A | B | C | D |
| --- | --- | --- | --- |

**11.**(1 pt) Match the following descriptions with their graphs below:

__ 1. The graph of the number of days until next Friday vs. time.
__ 2. The graph of the amount of time until midnight next Friday as a function of time.
__ 3. The graph of the number of days to the nearest Friday (in the future or in the past) as a function of time.
__ 4. The graph of the amount of time to the nearest Friday at midnight vs. time.



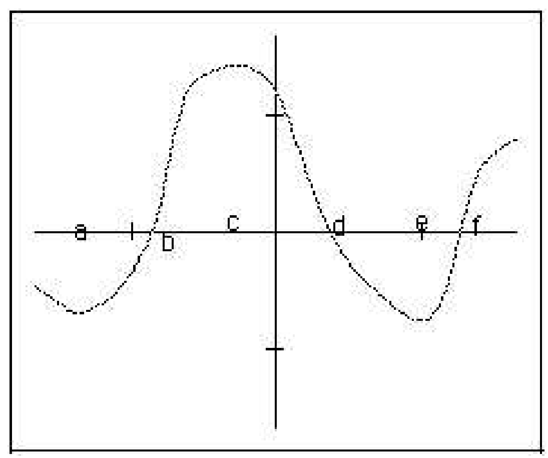

| A | B | C | D |
| --- | --- | --- | --- |




**12.**(1 pt)
The following questions concern the profits of firm N. The graph of the profits vs. time is given above. For each of the intervals enter the letters corresponding to the descriptions which describe the behavior of the graph on that interval. (The letters in each answer must be in alphabetical order with no spaces between the letters.)

__ 1. The interval from a to b
__ 2. The interval from b to c
__ 3. The interval from c to d
__ 4. The interval from d to e
__ 5. The interval from e to f

A. The firm makes a profit on this interval.
B. The firm registers a loss on this interval.
C. The profit of the firm increases on this interval.
D. The profit of the firm decreases on this interval.
E. Assuming the profits are reinvested in the firm the net-worth of the company is increasing on this interval.
F. Assuming the profits are reinvested in the firm the net-worth of the company is decreasing on this interval.




**13.**(1 pt)
The function to the left represents the velocity of a race car as it travels a linear track. Negative velocities mean the car is backing up.
For each interval, enter all letters whose corresponding statements are true for that interval.

__ 1. The interval from a to b

__ 2. The interval from b to c
__ 3. The interval from c to d
__ 4. The interval from d to e
__ 5. The interval from e to f

A. The car is moving forward on this interval
B. The car is backing up on this interval.
C. The forward velocity of the car is increasing on this interval.
D. The forward velocity of the car is decreasing on this interval.
E. The distance from the starting point is increasing on this interval.
F. The distance from the starting point is decreasing on this interval.

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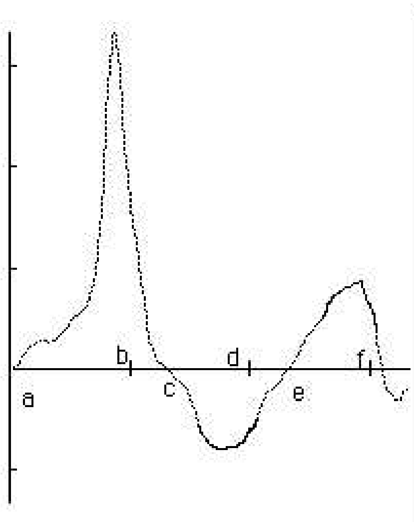


**14.**(1 pt)

The function to the left represents the displacement of a toy race car as it travels a linear track. Negative numbers mean the car is behind the starting line, positive numbers mean it is in front. Postive velocities mean it is moving forward, while negative velocities mean it is moving backwards.

Remember that a value which changes from -2 to -1 to 0 is increasing!

For each interval, enter all letters whose corresponding statements are true for that interval.

__ 1. The interval from a to b
__ 2. The interval from b to c
__ 3. The interval from c to d
__ 4. The interval from d to e
__ 5. The interval from e to f

A. The car is in front of the starting line on this interval
B. The car is behind the starting line on this inteval.
C. The velocity of the car is positive on this interval.
D. The velocity of the car is negative on this interval.
E. The displacement of the car from the starting line is increasing on this interval.
F. The displacement of the car from the starting line is decreasing on this interval.

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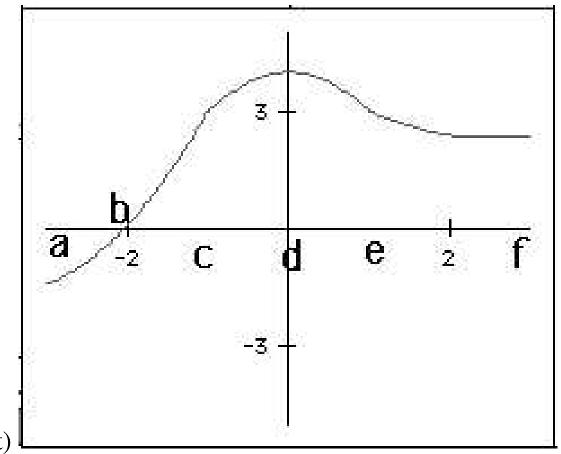


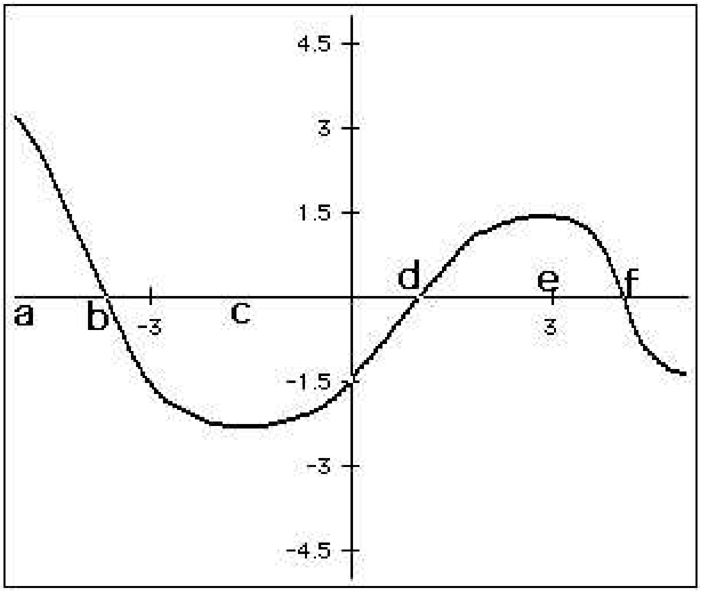

**15.**(1 pt)

A 5 gram weight is suspended from a string next to a ruler held vertically. The string is jiggled up and down and the graph of the POSITION of the weight vs. time in seconds is given above. The ruler is calibrated in inches and 0 is in the center of the ruler.

Enter the letters for the intervals which correspond to the statements below.

__ 1. The interval from a to b
__ 2. The interval from b to c
__ 3. The interval from c to d
__ 4. The interval from d to e
__ 5. The interval from e to f

A. The weight is moving upward on this interval.
B. The weight is moving downward on this interval.
C. The upward velocity of the weight is increasing on this interval.
D. The upward velocity of the weight is decreasing on this interval.
E. The (signed) distance from the starting point is increasing on this interval.
F. The (signed) distance from the starting point is decreasing on this interval.




**16.**(1 pt)
The graph indicates the RATE of absorbtion of carbon dioxide into a body of water. The rate varies with time. Positive quantities mean that the carbon dioxide is being abosrbed into solution, while negative quantities mean the carbon dioxide is being released to the air.
For each interval, enter all letters whose corresponding statements are true for that interval.)

__ 1. The interval from a to b
__ 2. The interval from b to c
__ 3. The interval from c to d
__ 4. The interval from d to e
__ 5. The interval from e to f

A. Carbon dioxide is being absorbed by the water on this interval.
B. Carbon dioxide is being released from the water on this interval.
C. The rate at which the carbon dioxide is being absorbed is increasing on this interval.
D. The rate at which the carbon dioxide is being absorbed is decreasing on this interval.
E. The total amount of carbon dioxide in the water is increasing on this interval.
F. The total amount of carbon dioxide in the water is decreasing on this interval.

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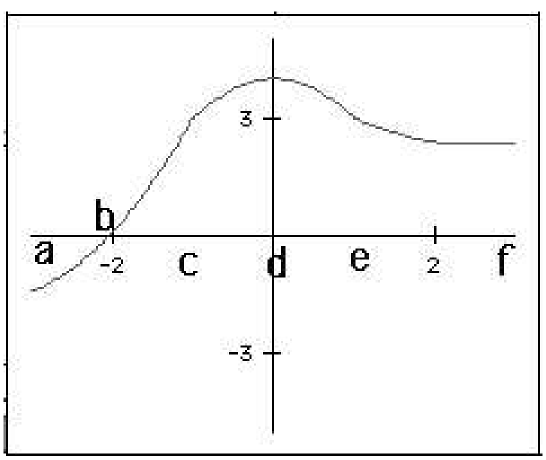


**17.**(1 pt)
Answer the questions about the function whose graph is shown above.

Enter the letters for the intervals which correspond to the statements below. The letters for each entry should be in alphabetical order with no spaces.

__ 1. The interval from a to b
__ 2. The interval from b to c
__ 3. The interval from c to d
__ 4. The interval from d to e
__ 5. The interval from e to f

A. The function is increasing on this interval.
B. The function is decreasing on this interval.
C. The slope of the function is increasing on this interval.
D. The slope of the function is decreasing on this interval.
E. The total (signed) area between the graph of the function and the x axis is increasing on this interval.
F. The total (signed) area between the graph of the function and the x axis is decreasing on this interval.

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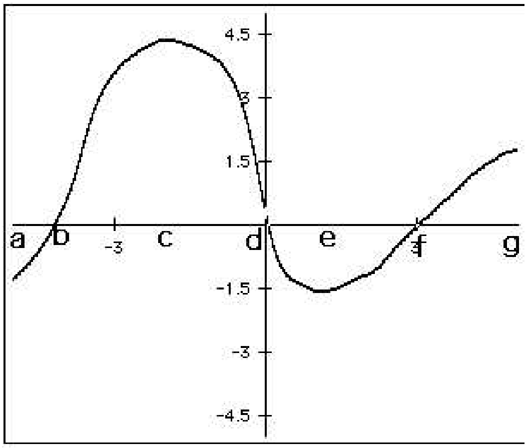


**18.**(1 pt)
The graph shown is the graph of the SLOPE of the tangent line of the original function. (This slope is also called the derivative of f.)
For each interval, enter all letters whose corresponding statements are true for that interval.

__ 1. The interval from a to b
__ 2. The interval from b to c
__ 3. The interval from c to d
__ 4. The interval from d to e
__ 5. The interval from e to f

A. The slope of the original function is positive on this interval
B. The slope of the original function is negative on this interval.
C. The slope of the original function is increasing on this interval.
D. The slope of the original function is decreasing on this interval.
E. The original function is increasing on this interval.
F. The original function is decreasing on this interval.
G. The shape of the original function is concave up on this interval.
H. The shape of the original function is concave down on this interval.

---

**19.**(1 pt) Determine which of the following statements are true and which are false. Enter the T or F in front of each statement.

Remember that $x \in (-1,1)$ is the same as $-1 < x < 1$
and $x \in [-1,1]$ means $-1 \leq x \leq 1$.

__ 1. The function $\sin(x)$ on the domain $x \in (-\pi/2, \pi/2)$ has at least one input which produces a smallest output value.
__ 2. The function $f(x) = x^2$ with domain $x \in [-3,3]$ has at least one input which produces a largest output value.
__ 3. The function $f(x) = x^2$ with domain $x \in (-3,3)$ has at least one input which produces a largest output value.
__ 4. The function $f(x) = x^2$ with domain $x \in [-3,3]$ has at least one input which produces a smallest output value.
__ 5. The function $\sin(x)$ on the domain $x \in [-\pi/2, \pi/2]$ has at least one input which produces a largest output value.

---

**20.**(1 pt) Determine which of the following statements are true and which are false. Enter the T or F in front of each statement.

Remember that $x \in (-1,1)$ is the same as $-1 < x < 1$
and $x \in [-1,1]$ means $-1 \leq x \leq 1$.

__ 1. The function $f(x) = x^3$ with domain $x \in [-3,3]$ has at least one input which produces a largest output value.
__ 2. The function $f(x) = x^3$ with domain $x \in (-3,3)$ has at least one input which produces a smallest output value.
__ 3. The function $f(x) = x^3$ with domain $x \in (-3,3)$ has at least one input which produces a largest output value.
__ 4. The function $f(x) = x^3$ with domain $x \in [-3,3]$ has at least one input which produces a smallest output value.
__ 5. The function $\sin(x)$ on the domain $x \in [-\pi, \pi]$ has at least one input which produces a smallest output value.

---

**21.**(1 pt) Now for some review problems:
Find the domain of this function:

$$\sqrt[2]{-4+7x}$$

(which reads the 2th root of $-4+7x$ ).
The function is defined on the interval from ____ to ____ .
Use INF for infinity or -INF for minus infinity.
Similar problems in the book: section 1.1/23-36

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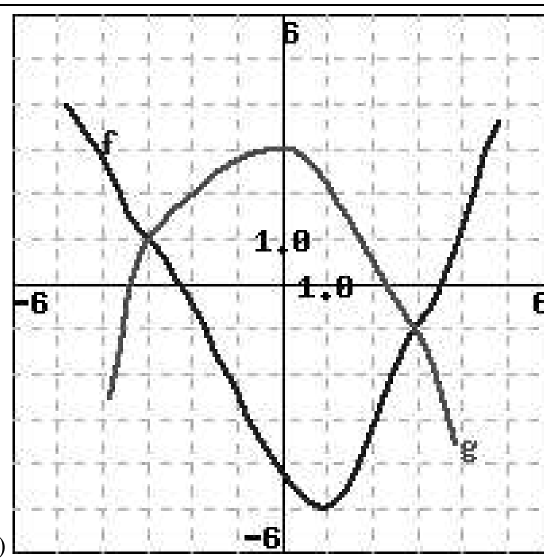
Now find the domain of this function:

$$\sqrt[3]{-4+7x}$$

(which reads the 3th root of $-4+7x$ ).
The function is defined on the interval from ____ to ____ .

---




**22.**(1 pt)
Given the graphs of $f$ (in blue) and $g$ (in red) to the left answer these questions:

__ 1. What is the value of $f$ at -5?

— 2. For what values of $x$ is $f(x) = g(x)$: Separate answers by spaces (e.g " 5 7")

— 3. Estimate the solution of the equation $g(x) = -4$

— 4. On what interval is the function $f$ decreasing? (Separate answers by a space: e.g. "-2 4")

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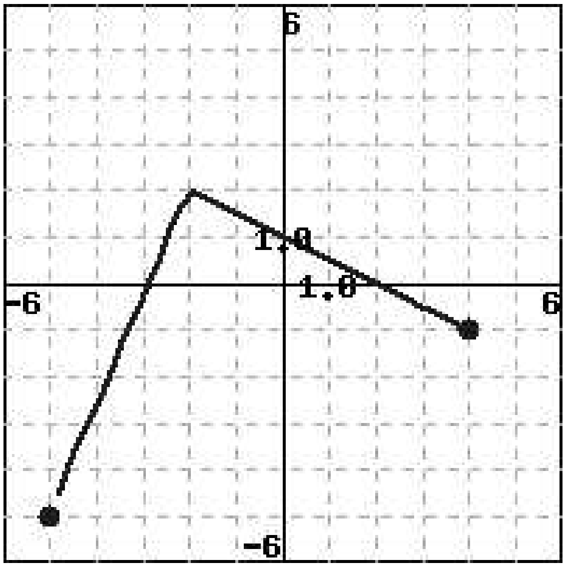


**23.**(1 pt)
Write the equation describing the graph above:

| | | |
|---|---|---|
| | — | for x in the interval [ — to — ] |
| $f(x) =$ | | |
| | — | for x in the interval [ — to — ] |

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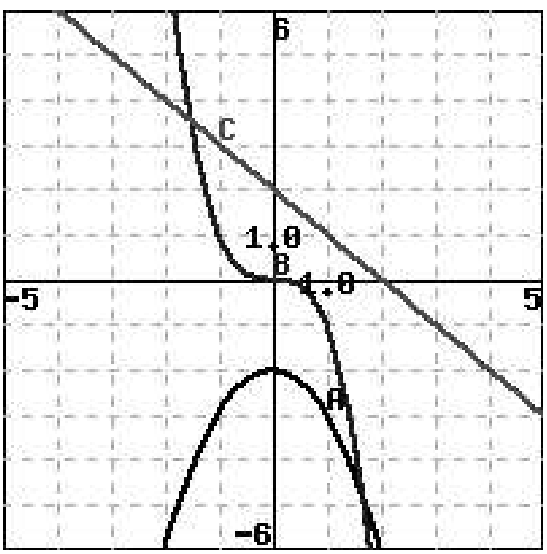


**24.**(1 pt)
Match the functions shown in the graph above with their formulas:

— 1. $-x^3$

— 2. $-x^2 - 2$

— 3. $-x + 2$

---

**25.**(1 pt) Use a graphing calculator to find the positive value of $x$ which satisfies $x = 3.000\cos(x)$. Give the answer to 2 decimal places.______

Remember to calculate the trig functions in radian mode.

If you don't have a graphing calculator you can use the program Xfunctions which is installed on most of the Macintoshes in CLARC (except for the ones in the Mac classrooms). The program is free and you can download it for your own computer – see **Mac Software** – if you have a Mac. If you have a PC try the CD that came with the textbook – see if that will graph equations for you.

---

**26.**(1 pt) Use a graphing calculator to find the largest value of $x$ which satisfies $x^4 - 2.000x + 2.000 = 5.000x^3 - 1.000x^2$. Give the answer to 2 decimal places.______

Remember to calculate the trig functions in radian mode.

---

**27.**(1 pt) Find the domain of the function $f(x) = \sqrt{x^3 - 9x}$. What is the least value of $x$ in the domain?

Least Value=______

---

**28.**(1 pt) Find the domain of the function $f(x) = \frac{1}{3x+6}$. What is the only value of $x$ not in the domain?

Only Value=______

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**29.**(1 pt) Find the domain of the function $f(x) = \sqrt{\frac{1}{x^2+10x-24}}$. What is the greatest value of $x$ not in the domain?

Greatest Value=______

**30.**(1 pt) Find the domain of the function $f(x) = \sqrt{\frac{10-7x}{8+5x}}$. What is the greatest value of $x$ in the domain?
Greatest Value=__________

---

**31.**(1 pt) Define a function $f(x)$ by:

$$f(x) = \begin{cases} 6-4x, & \text{if } x \geq 8 \\ 64-x^2, & \text{if } x < 8 \end{cases}$$

$f(10) =$__________
$f(3) =$ __________
Looking only at values of $x$ to the left of 8, what would you expect $f(8)$ to be?__________
Looking only at values of $x$ to the right of 8, what would you expect $f(8)$ to be?__________
Now for fun, try graphing $f(x)\ldots$

---

**32.**(1 pt) For $x < \frac{1}{11}$, the function $f(x) = |11x-1|+2$ is equivalent to the function $g(x) = mx+b$ for:
$m =$__________
and
$b =$ __________
Now for fun, try graphing $f(x)\ldots$

---

**33.**(1 pt) Let $p(x) = 2.7x^{0.8}$. Use a calculator or a graphing program to find the slope of the tangent line to the point $(x, p(x))$ when $x = 2.7$). Give the answer to 3 places. __________

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