1. (1 point)
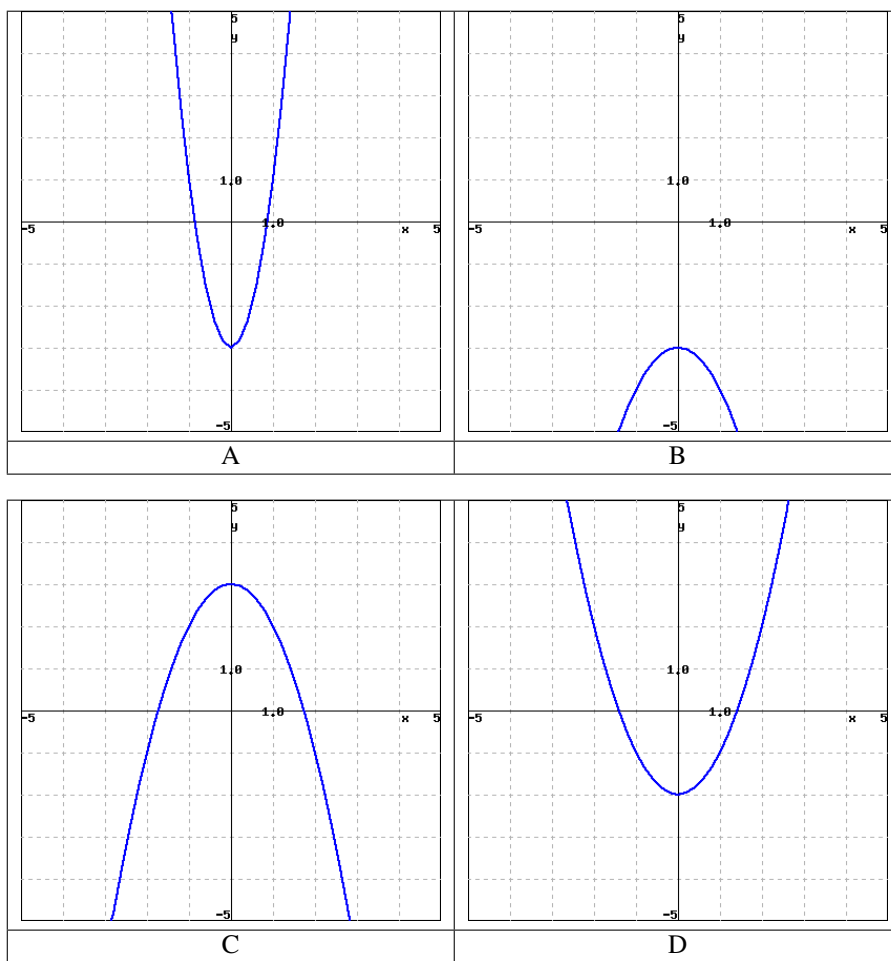
Use properties of functions to match each of the following functions with its graph. *Do not use your calculator.* Clicking on a graph will give you an enlarged view.

? 1. $f(x) = x^2 - 2$
? 2. $f(x) = 4x^2 - 3$
? 3. $f(x) = -x^2 + 3$
? 4. $f(x) = -x^2 - 3$

A

B

C

D

Correct Answers:

- D
- A
- C
- B

2. (1 point) Let $f(x) = \frac{x-9}{x^2+8x+16}$. Use interval notation to indicate the domain of $f(x)$.

Note: You should enter your answer in **interval notation**. If the set is empty, enter "" without the quotation marks.

Domain = _____

Correct Answers:

- (-infinity,-4) U (-4,infinity)

3. (1 point) Let

$$f(x) = \sqrt[4]{x^2 - 7x}.$$

Use interval notation to indicate the domain of $f(x)$.

Note: When entering interval notation in WeBWorK, use **I** for ∞, **-I** for $-\infty$, and **U** for the union symbol. If the set is empty, enter "" without the quotation marks.
Domain = _____
Correct Answers:

- (-infinity,0] U [7,infinity)

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4. (1 point) An open rectangular box (no top) with volume 6 cubic meters has a square base. Express the surface area S of the box as a function of the length x of one of the sides of the base.
$S(x) =$ _____
Correct Answers:

- x**2 + 4*6/x

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5. (1 point) Relative to the graph of

$$y = \sin(x)$$

the graphs of the following equations have been changed in what way?

___1. $y = \sin(x + 18)$
___2. $y = \sin(x) - 18$
___3. $y = 18\sin(x)$
___4. $y = \sin(x/18)$

A. shifted 18 units down
B. stretched vertically by the factor 18
C. stretched horizontally by the factor 18
D. shifted 18 units left

Correct Answers:

- D
- A
- B
- C

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6. (1 point) Suppose that

$$f(x) = \sqrt{7x}, \quad g(x) = \frac{x}{x-1}, \quad \text{and} \quad h(x) = \sqrt[3]{12x}.$$

Find $(f \circ g \circ h)(x)$.
$(f \circ g \circ h)(x) =$ _____
Correct Answers:

- ((7*(12*x)**(1/3))/((12*x)**(1/3) - 1))**(1/2)

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7. (1 point) Suppose that

$$f(x) = \sqrt{5x - 7} \quad \text{and} \quad g(x) = 2x^2 - 7.$$

For each function h given below, find a formula for $h(x)$ and the domain of h. Enter the domains using **interval notation**.

(A) $h(x) = (f \circ g)(x)$.

$h(x) =$ _____
Domain = _____

(B) $h(x) = (g \circ f)(x)$.

$h(x) =$ _____
Domain = _____

(C) $h(x) = (f \circ f)(x)$.

$h(x) =$ _____
Domain = _____

(D) $h(x) = (g \circ g)(x)$.

$h(x) =$ _____
Domain = _____
Correct Answers:

- sqrt(5*2*x^2+5*(-7)+(-7))
- (-infinity,-2.04939015319192] U [2.04939015319192,infinity)
- 2*(5*x+(-7))+(-7)
- [1.4,infinity)
- sqrt(5*sqrt(5*x+(-7))+(-7))
- [1.792,infinity)
- 2*(2*x^2+(-7))^2+(-7)
- (-infinity,infinity)

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8. (1 point) If $\cos(t) = -\frac{7}{8}$ where $\pi < t < \frac{3\pi}{2}$, find the values of the following trigonometric functions.

Note: Give exact answers, do not use decimal numbers. The answer should be a fraction or an arithmetic expression. If the answer involves a square root it should be enter as sqrt; e.g. the square root of 2 should be written as sqrt(2).

$\cos(2t) =$ _____
$\sin(2t) =$ _____
$\cos(\frac{t}{2}) =$ _____
$\sin(\frac{t}{2}) =$ _____
Correct Answers:

- 34/64

- `2*7*sqrt(15)/64`
- `-0.25`
- `0.968245836551854`

9. (1 point) Use a sum or difference formula or a half angle formula to determine the value of the trigonometric functions. Give exact answers. Do not use decimal numbers. The answer should be a fraction or an arithmetic expression. If the answer involves a square root it should be enter as sqrt; e.g. the square root of 2 should be written as sqrt(2);

$\sin(\frac{13\pi}{12}) = $ _____

$\sin(\frac{7\pi}{12}) = $ _____

$\cos(\frac{13\pi}{12}) = $ _____

$\cos(\frac{11\pi}{8}) = $ _____

Correct Answers:

- `-0.258819045102521`
- `0.965925826289068`
- `-0.965925826289068`
- `-0.38268343236509`

10. (1 point) The expressions A,B,C,D, E are left hand sides of identities. The expressions 1,2,3,4,5 are right hand side of identities. Match each of the left hand sides below with the appropriate right hand side. Enter the appropriate letter (A,B,C,D, or E) in each blank.

A. $\tan(x)$

B. $\cos(x)$

C. $\sec(x)\csc(x)$

D. $\frac{1-(\cos(x))^2}{\cos(x)}$

E. $2\sec(x)$

____1. $\sin(x)\sec(x)$

____2. $\frac{\cos(x)}{1-\sin(x)} + \frac{1-\sin(x)}{\cos(x)}$

____3. $\sec(x) - \sec(x)(\sin(x))^2$

____4. $\tan(x) + \cot(x)$

____5. $\sin(x)\tan(x)$

Correct Answers:

- A
- E
- B
- C
- D