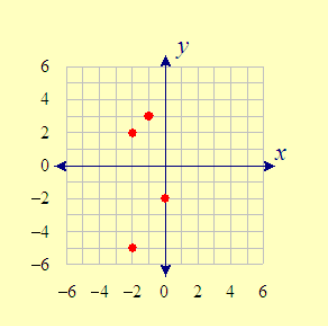
30. Given the following relation:

$$T = \{ (-2, -5), (-1, 3), (-2, 2), (0, -2) \}$$

Step 1. Describe the domain and range for the relation.

Step 2. Determine if the given relation is a function. If it is not, identify two ordered pairs as proof.



Answer: Function: A) yes B) no

31. Given the following function:

$$f(x) = \sqrt{x - 3} - 3$$

Step 1. Determine $f(x^2)$.

Step 2. Determine the implied domain of the given function. Express your answer in interval notation.

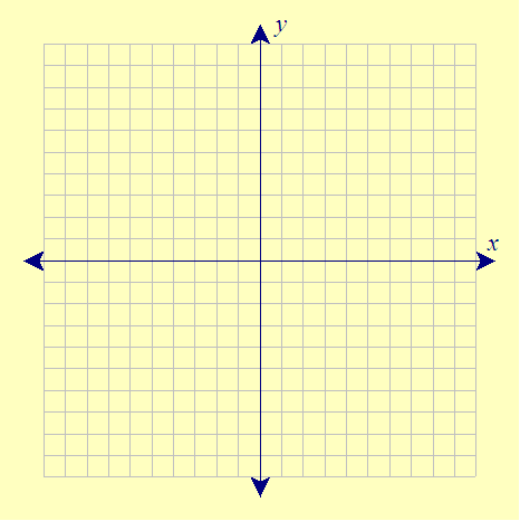
32. Consider the following quadratic function.

$$t(x) = -(x + 5)^2 - 3$$

Step 1. Find the vertex of this function.

Step 2. Determine the number of x-intercept(s), then enter the x-intercept(s), if any, of this function as ordered pair(s) below.

Step 3. Graph this quadratic function by identifying two points on the parabola other than the vertex and the x-intercepts.



A: ( ) **B:** ( )

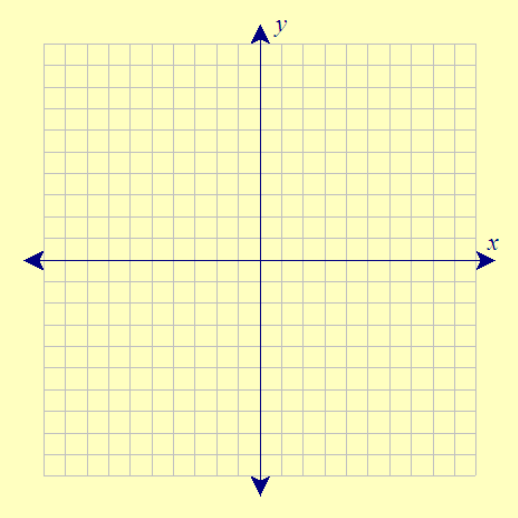
33. Consider the following quadratic function. Reduce all fractions to the lowest terms.

$$q(x) = -2x^2 + 4x$$

Step 1. Find the vertex of this function.

Step 2. Determine the number of x-intercept(s), then enter the x-intercept(s), if any, of this function as ordered pair(s) below.

Step 3. Graph this quadratic function by identifying two points on the parabola other than the vertex and the x-intercepts.



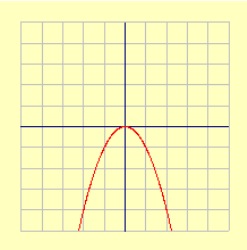
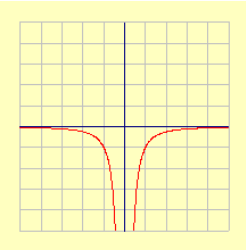
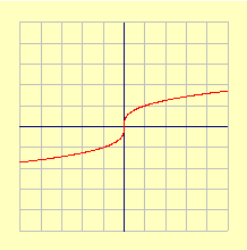
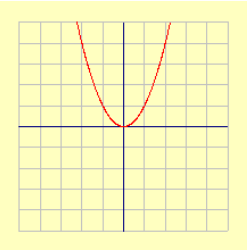
A: (☐ ☐)

B: (☐ ☐)

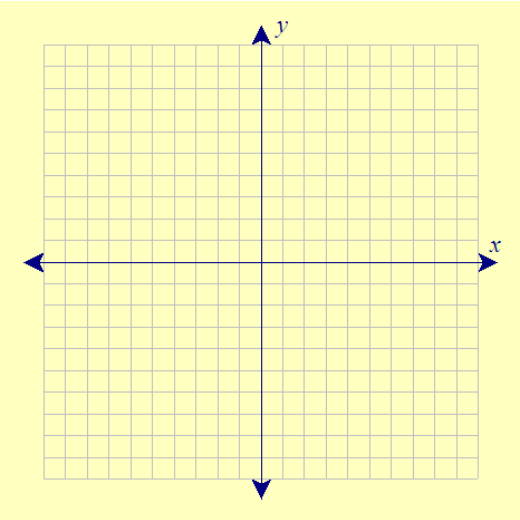
34. Consider the following function.

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

Step 1. Indicate the general shape of the graph of the given function. Select the appropriate graph below.

Step 2. Find two points on the graph of this function, other than the origin (0, 0), and use these points to plot the graph of the function.



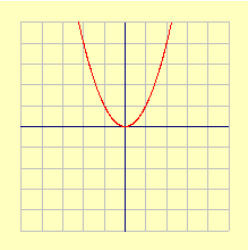
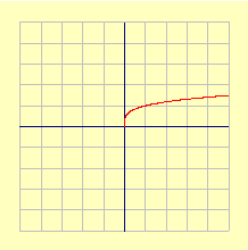
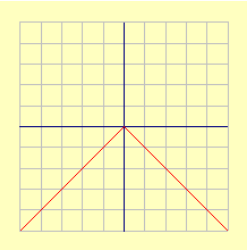
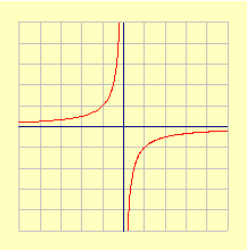
A: (☐ , ☐ **)**

B: (☐ , ☐ **)**

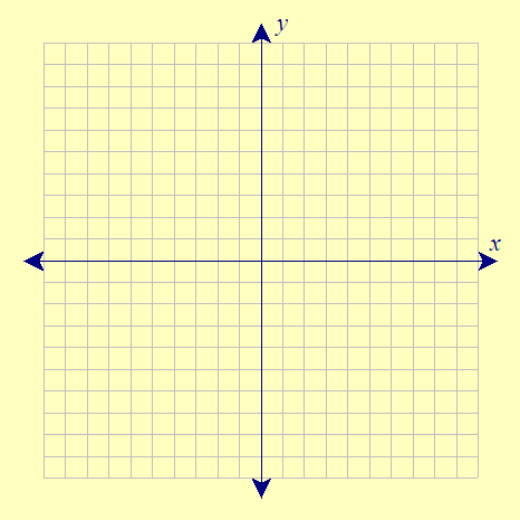
35. Consider the following function.

$$w(x) = \frac{5\sqrt[4]{x}}{2}$$

Step 1. Indicate the general shape of the graph of the given function. Select the appropriate graph below.

Step 2. Find two points on the graph of this function, other than the origin (0, 0), and use these points to plot the graph of the function. (Round off to two decimal places.)



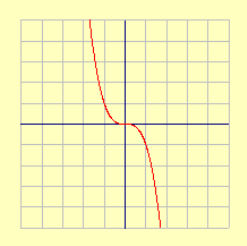
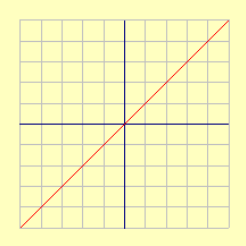
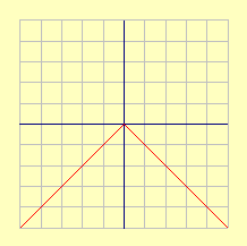
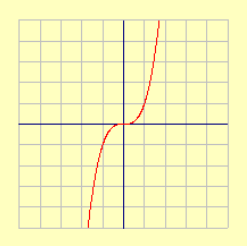
A: (☐ , ☐ **)**

B: (☐ , ☐ **)**

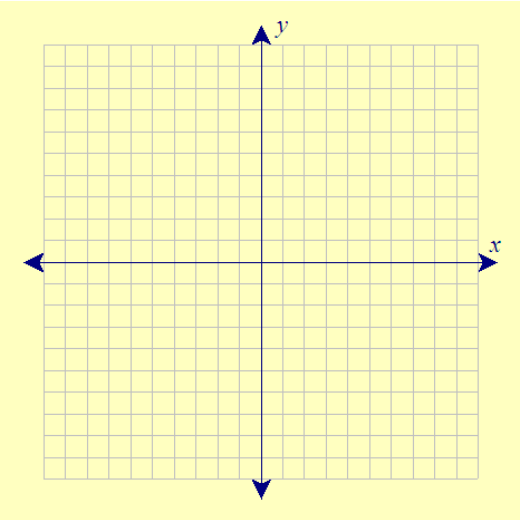
36. Consider the following function.

$$u(x) = -\frac{4}{3}|x|$$

Step 1. Indicate the general shape of the graph of the given function. Select the appropriate graph below.

Step 2. Find two points on the graph of this function, other than the origin (0, 0), and use these points to plot the graph of the function.



A: (☐ , ☐)

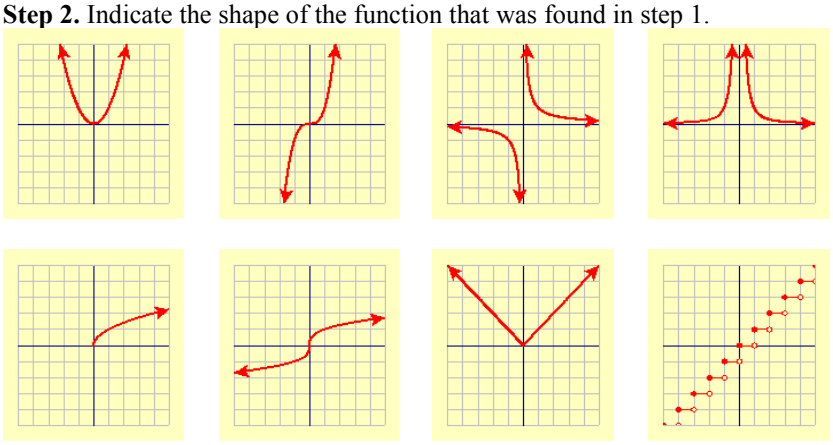
B: (☐ , ☐)

37. Consider the following function.

$$p(x) = \sqrt{x - 2} + 3$$

Step 1. Identify the more basic function that has been shifted, reflected, stretched, or compressed.

Step 2. Indicate the shape of the function that was found in step 1.



Step 3. Graph this function by indicating how the basic function found in step 1 has been shifted, reflected, stretched, or compressed.

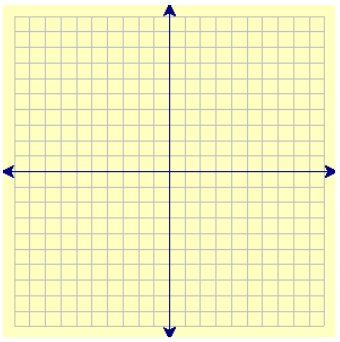
Horizontal Shift A) Left B) Right C) None

Stretch/Compress A) Stretch B) Compress C) None

x-Axis Reflection A) Yes B) No

y-Axis Reflection A) Yes B) No

Vertical Shift A) Up B) Down C) None



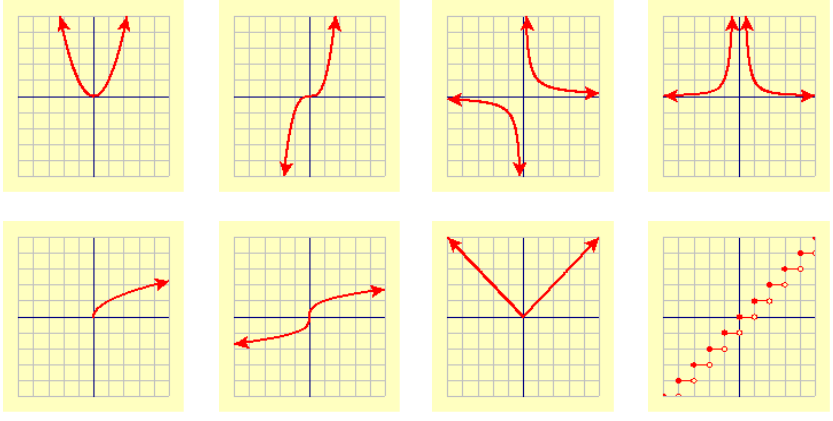
Step 4. Determine the domain and range of this function. Write your answer in interval notation or symbol notation.

38. Consider the following function.

$$g(x) = (x - 2)^3$$

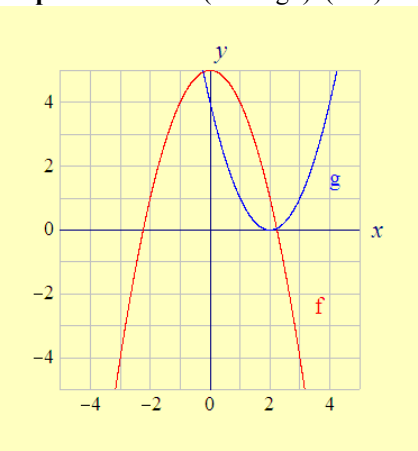
Step 1. Identify the more basic function that has been shifted, reflected, stretched, or compressed.

Step 2. Indicate the shape of the function that was found in step 1.



39. For the graph shown:

Step 1. Determine (f + g) (3).



Answer:

Step 2. Determine (f − g) (3).

Step 3. Determine (f g) (3).

Step 4. Determine $\left(\frac{f}{g}\right)$ (3).

40. For f (−11) = 9 and g (−3) = −11 determine (f ∘ g)(−3).

41. For f (x) = 3x and g (x) = x − 5

Step 1. Find the formula for (f + g)(x).

Step 2. Find the formula for $\left(\frac{f}{g}\right)(x)$.

42. For f (x) = $\frac{1}{x}$ and g (x) = x^3

Step 1. Determine the formula for (f ∘ g)(x).

Step 2. Determine the formula for (g ∘ f)(x).

43. Given the following relation:

S = { (3, 4), (6, −8), (5, 8), (−4, 3) }

Step 1. Enter the inverse of the above relation.

Step 2. Enter the domain and range of the inverse.

44. Find a formula for the inverse of the given function.

r (x) = $3x^{\frac{1}{3}}$ − 2