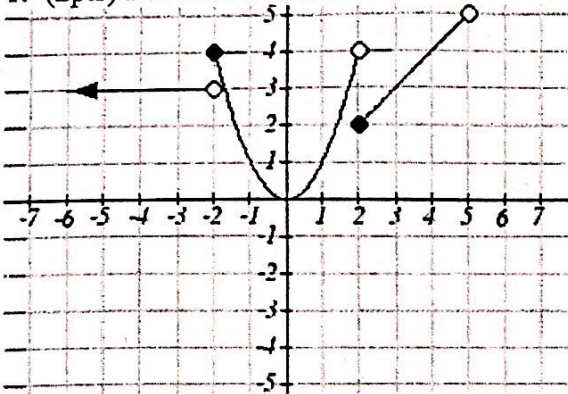


NAME KEY

- 1.3 (Piecewise defined functions)
- 1.4 (Composition of functions)
- 1.5 (Transformations)

1. (2pts) For the Piecewise defined function below fill in the missing information:

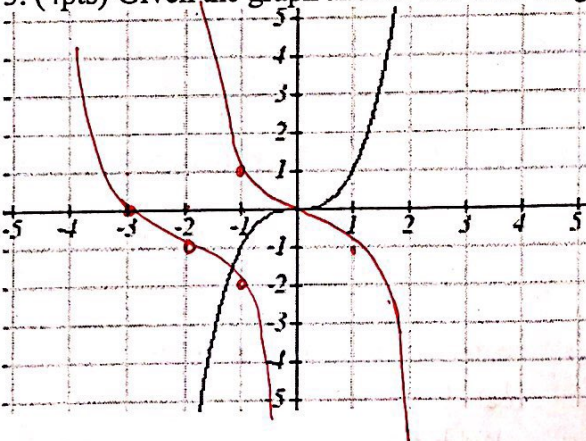


$$f(x) = \left\{ \begin{array}{ll} 3 & \text{if } -\infty < x < -2 \\ x^2 & \text{if } -2 \leq x < 2 \\ x & \text{if } 2 \leq x < 5 \end{array} \right.$$

2. (3pts) Given the two functions  $f(x) = x^2 - 4x + 1$  and  $g(t) = 1 - t$

- a. Find & Simplify  $f(g(t)) = g(t)^2 - 4g(t) + 1 = (1-t)^2 - 4(1-t) + 1 = 1 - 2t + t^2 - 4 + 4t + 1 = t^2 + 2t - 2$
- b. Find & Simplify  $g(f(x)) = 1 - f(x) = 1 - (x^2 - 4x + 1) = 1 - x^2 + 4x - 1 = -x^2 + 4x$

3. (4pts) Given the graph answer the following questions:



a. Name this toolkit function & write its equation.

$$f(x) = x^3$$

b. Is this function even / odd or neither? (circle one)

*symmetric about origin*

c. Given the transformation  $-f(x+2) - 1$

1. Describe the transformation in words

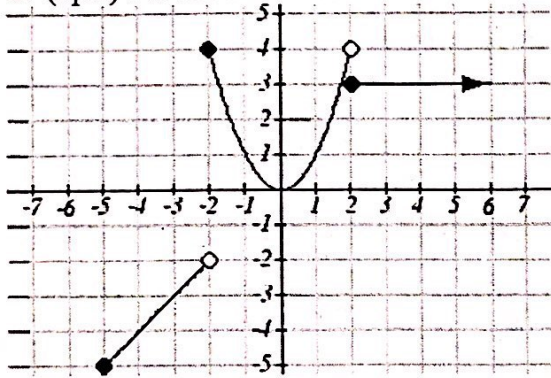
*vertical reflection  
left 2  
down 1*

2. Sketch the transformation on the same graph as the original toolkit function

NAME KEY

- 1.3 (Piecewise defined functions)
- 1.4 (Composition of functions)
- 1.5 (Transformations)

1. (2pts) For the Piecewise defined function below fill in the missing information:



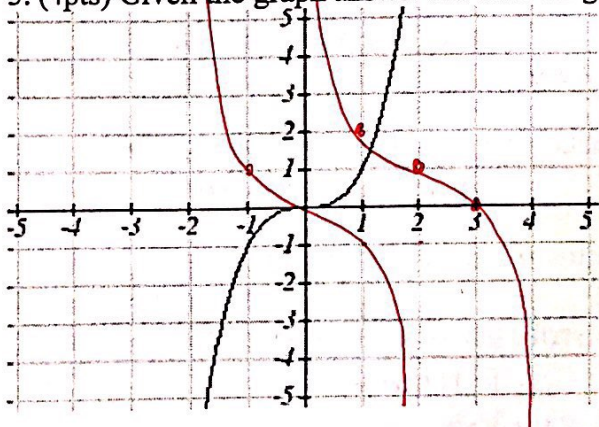
$$f(x) = \begin{cases} x^2 & \text{if } -5 \leq x < -2 \\ 3 & \text{if } -2 \leq x < 2 \\ 3 & \text{if } 2 \leq x < \infty \end{cases}$$

2. (3pts) Given the two functions  $f(x) = x^2 - 2x + 1$  and  $g(t) = 1 - t$

a. Find & Simplify  $f(g(t)) = (1-t)^2 - 2(1-t) + 1 = 1 - 2t + t^2 - 2 + 2t + 1 = t^2$

b. Find & Simplify  $g(f(x)) = 1 - (x^2 - 2x + 1) = -x^2 + 2x$

3. (4pts) Given the graph answer the following questions:



d. Name this toolkit function & write its equation.

$f(x) = x^3$

e. Is this function even / odd or neither? (circle one)

f. Given the transformation  $-f(x-2)+1$

1. Describe the transformation in words

vertical reflection  
right 2  
up 1

2. Sketch the transformation on the same graph as the original toolkit function