Operations with Functions

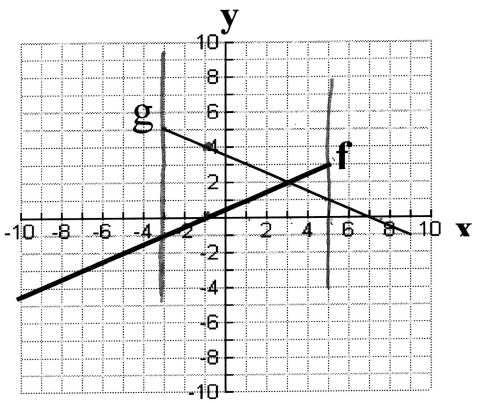
If two functions have domains that overlap, they can be added, subtracted or multiplied to create a new function on the shared portion of the domain.

The operations can be performed on functions represented in multiple forms.

Graphs

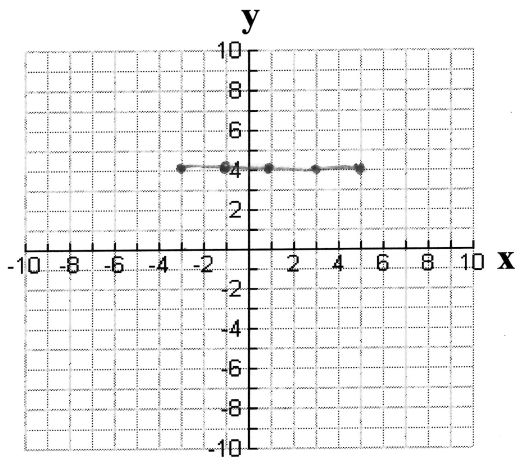
Operations on functions represented by graphs can be done on the dependent variable across common parts of the domain.

Consider the two functions below:

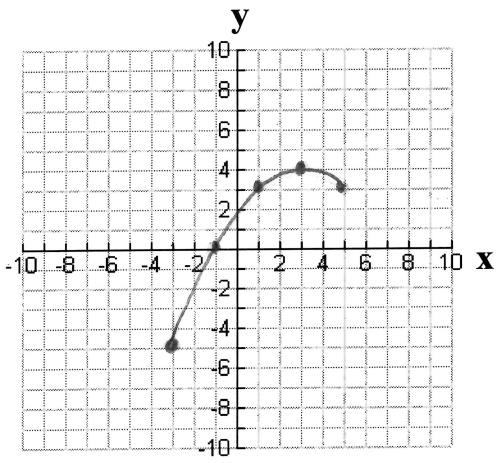


Create graphs to represent the following:

a) f + g

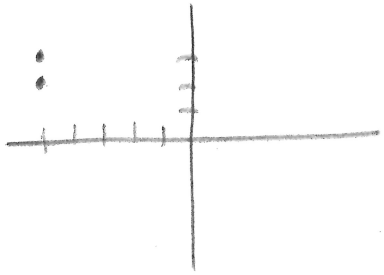


b) fg



Set (Collection of Data Points)

f = {(-5, 2), (-3, 1), (-1, 7), (3, 4), (6, 5)}
g = {(-5, 3), (-3, -2), (0, 7), (3, -5), (6, -2), (7, 10)}



Determine the following:

a) f + g
$= \{(-5,5),(-3,-1),(3,-1),(6,3)\}$

b) fg
$= \{(-5,6),(-3,-2),(3,-20),(6,-10)\}$

Equations

Consider the following functions:

$f(x) = x^3 + 6x$ $\quad$ $g(x) = 2x - 1$

Determine the following:

a) $h(x) = f(x) - g(x)$
$= (x^3+6x)-(2x-1)$
$= x^3+4x+1$

b) $m(x) = f(x)g(x)$
$= (x^3+6x)(2x-1)$
$= 2x^4 - x^3 + 12x^2 - 6x$

Note: The degree of a function is the highest exponent found on any term in a polynomial function.

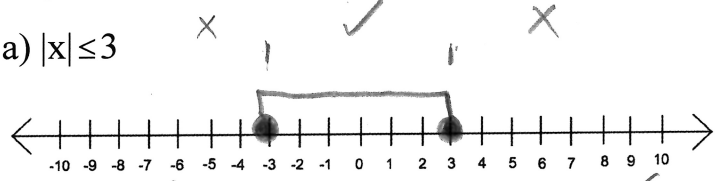
What is the degree the functions h(x) and m(x) above?

a) degree = 3 $\quad$ b) degree = 4

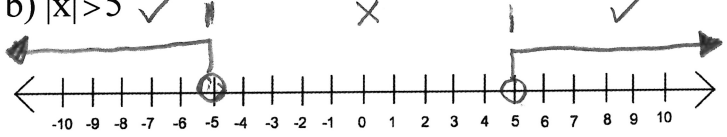
Absolute Value

Highlight the portions of the numberline represented by each:

a) $|x| \leq 3$



b) $|x| > 5$



c) $|x| \leq -7$

d) $|x| > -2$