

# Advanced Math

1-5

(Day 2)

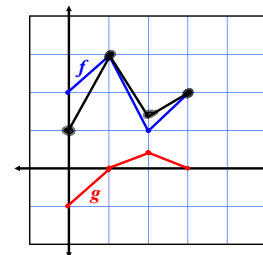
## Combinations of Functions

Use the graphs of  $f$  and  $g$  to graph

$$h(x) = (f+g)(x).$$

$$= f(x) + g(x)$$

add y's



21)  $f(x) = x^2$ ,  $g(x) = 1 - x$

Find a)  $(f+g)(x)$ ,  $x^2 + 1 - x$   
 $x^2 - x + 1$

b)  $(f-g)(x)$ ,  $x^2 - (1-x)$   
 $x^2 + x - 1$

c)  $(fg)(x)$ ,  $x^2(1-x)$   
 $x^2 - x^3 = -x^3 + x^2$

d)  $(f/g)(x) = \frac{x^2}{1-x}$

domain:  $\mathbb{R}$  except  $\{1\}$

Evaluate the indicated operations for  $f(x) = x^2 + 1$  and  $g(x) = x - 4$ .

33)  $(fg)(4) = f(4) \cdot g(4)$   
 $= (4^2 + 1)(4 - 4)$   
 $= 0$

Find a)  $f \circ g$ , b)  $g \circ f$ , and  $f \circ f$ .

53)  $f(x) = 3x + 5$ ,  $g(x) = 5 - x$

$$\begin{aligned} f \circ g &= f(g(x)) \\ &= f(5-x) = 3(5-x) + 5 \\ &= 15 - 3x + 5 \\ &= -3x + 20 \end{aligned}$$

$$\begin{aligned} g \circ f &= g(f(x)) \\ &= g(3x+5) = 5 - (3x+5) \\ &= 5 - 3x - 5 \\ &= -3x \end{aligned}$$

$$\begin{aligned} f \circ f &= f(f(x)) \\ &= f(3x+5) \\ &= 3(3x+5) + 5 \\ &= 9x + 15 + 5 \\ &= 9x + 20 \end{aligned}$$

Assignment:

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9-18 all,

22-38 every 4th,

52-60 even,

62-70 all, 78, 80,

85 - 89 all

Assignment:  
Handout