SM 2

Date: **Section:**

Objective:

Often, it is useful to combine two functions to make a new function. For instance, you may have a function describing the revenue from a product and a function describing the costs of producing the product. By subtracting the two functions, you can create a function describing the profit made from the product.

Steps:

1.

2.

3.

Tips:

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- .
- .
- .

Examples: Let $f(x)=3x-5$ and $g(x)=x^2+5x-2.$ Perform the indicated operations.

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

b) $h(x)=f(x)-g(x)$

c) $h(x)=g(x)-f(x)$

d) $h(x)=2f(x)+3g(x)$

e) $h(x)=-f(x)+4g(x)$

f) $h(x)=f(x)-5f(x)$

g) $h(x)=f(x)\cdot g(x)$

h) $h(x)=f(x)\cdot f(x)$

Evaluating Combined Functions

1.

2.

3.

4.

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Examples: Let $f(x)=2x-7,$ and let $g(x)=-x^2+3.$ Evaluate the following.

a) $f(2)+g(1)$

b) $f(0)-g(-3)$

c) $f(-2)\cdot 3g(2)$

Examples: Let $f(x)=3x-5$ and $g(x)=(x+3)(x-1)$ Perform the indicated operations and state the domain of the new function.

a) $r(x)=\dfrac{g(x)}{f(x)}$

b) $r(x)=\dfrac{f(x)}{g(x)}$

Domain:

Domain:

c) $r(x)=\dfrac{2f(x)}{f(x)}$

d) $r(x)=\dfrac{g(x)}{-3g(x)}$

Domain:

Domain:

Examples: Let $f(x)=3x-5$ and $g(x)=(x+3)(x-1)$ Evaluate the following functions with the given values and functions.

a) $\dfrac{f(2)}{g(-2)}$

b) $\dfrac{-2f(5)}{g(-1)}$

Story Problems Involving Combined Functions

a) A company estimates that its cost and revenue can be modeled by the functions $C(x)=0.6x^2+49x+150$ and $R(x)=100x+75,$ where x is the number of items produced. The company's profit, $P,$ can be modeled by $P(x)=R(x)-C(x).$ Find the profit equation and determine the profit when 60 items are produced.

b) A service committee is organizing a fundraising dinner. The cost of renting a facility is \$250 plus \$3 per person, or $C(x)=3x+250,$ where x represents the number of people attending the fundraiser. The committee wants to charge attendees \$20 each or $R(x)=20x.$ How many people must attend the fundraiser for the event to raise \$500?