



Solve:

Factor

1. $x^2 + 7x + 10$

2. $(2^4 + 4) \div 5 \times 3 - 7 + 4$



Operations

With

+

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Functions

• • • | Function Notation

$$f(x) = 3x^2 - x + 2$$

$y = f(x)$ y is a function of x

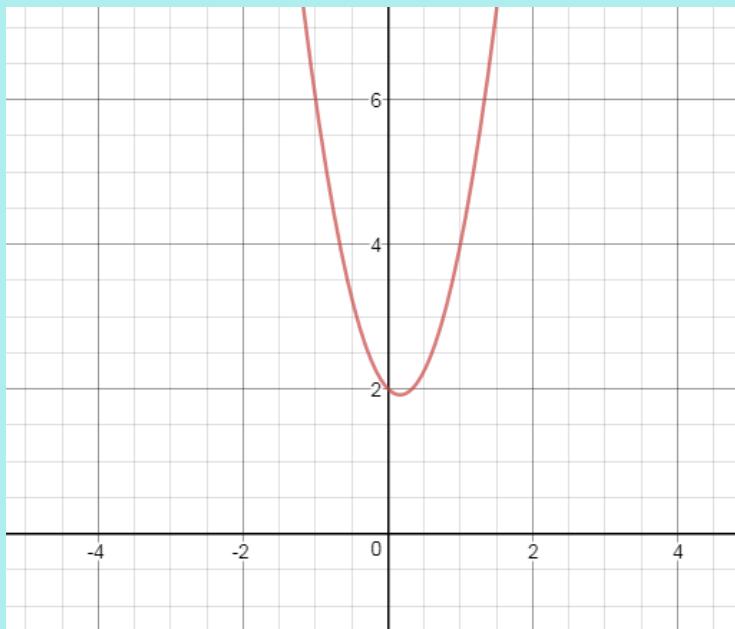
evaluate:

$$f(-3) \quad f(0) = 2 \quad f(4) = 46$$

$$f(-3) = 3(-3)^2 - (-3) + 2$$

$$f(-3) = 32$$

$$\begin{array}{|c|c|} \hline x & f(x) \\ \hline -3 & 32 \\ \hline \end{array}$$



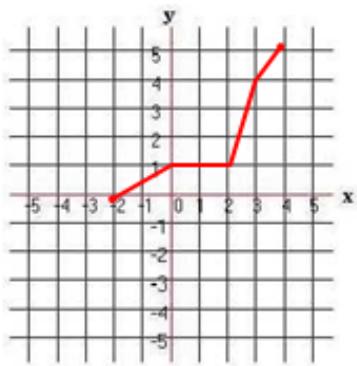
Operations With Functions

Operations

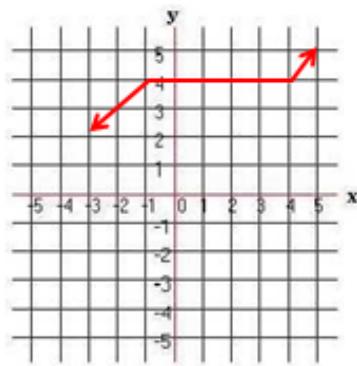


- Sum: $(f + g)(x) = f(x) + g(x)$
- Difference: $(f - g)(x) = f(x) - g(x)$
- Product: $(f \cdot g)(x) = f(x) \cdot g(x)$
- Quotient: $\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}, \quad g(x) \neq 0$

Find: $f(2) + g(4)$

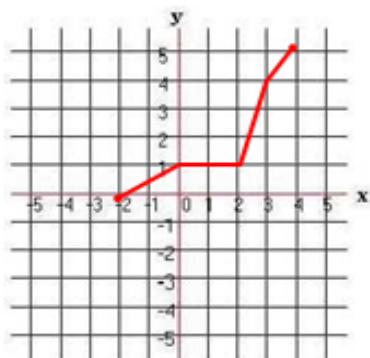


$f(x)$

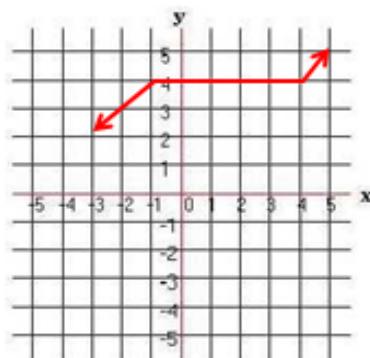


$g(x)$

Find: $f(-2) - g(-1)$



$f(x)$



$g(x)$

Given $f(x) = x^2 - x + 2$

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

$f(x) + g(x)$

$$(x^2 - x + 2) + (x^2 + x - 4)$$
$$\underline{x^2 - x + 2} + \underline{x^2 + x - 4}$$
$$2x^2 - 2$$

$g(x) + g(x)$

$$(x^2 + x - 4) + (x^2 + x - 4)$$
$$\underline{x^2 + x - 4} + \underline{x^2 + x - 4}$$
$$2x^2 + 2x - 8$$

$g(x) + f(x)$

• • • | $f(x) = x^2 + 2x - 3$ $g(x) = x^2 - 3x + 4$

$f(x) - g(x)$ $(x^2 + 2x - 3) - (x^2 - 3x + 4)$ $\cancel{x^2} + \cancel{2x} - \cancel{3} - \cancel{x^2} + \cancel{3x} - \cancel{4}$ <div style="border: 1px solid red; padding: 5px; display: inline-block;">$5x - 7$</div>	$g(x) - f(x)$ $(x^2 - 3x + 4) - (x^2 + 2x - 3)$ $\cancel{x^2} - \cancel{3x} + \cancel{4} - \cancel{x^2} - \cancel{2x} + \cancel{3}$ <div style="border: 1px solid purple; padding: 5px; display: inline-block;">$-5x + 7$</div>
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$f + g$	$f - g$
$\begin{array}{l} f(x) = 3x + 7 \\ g(x) = 2x - 1 \end{array}$	

• • • $f(x) = 3x + 7$ $g(x) = 2x - 1$ <hr/> $f(x) = g(x)$ $\cancel{3x+7} = \cancel{2x-1}$ $x + 7 = -1$ $x = -8$	$f(x) = 20$ $3x + 7 = 20$ $\frac{3x}{3} = \frac{13}{3}$ $x = \frac{13}{3}$ $g(x) = 9$
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$$h(x) = x + 3$$

$$k(x) = 2x - 4$$



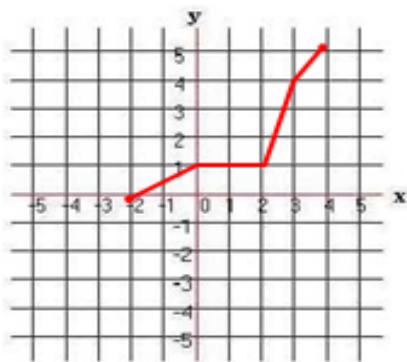
$$h + k$$

$$h - k$$

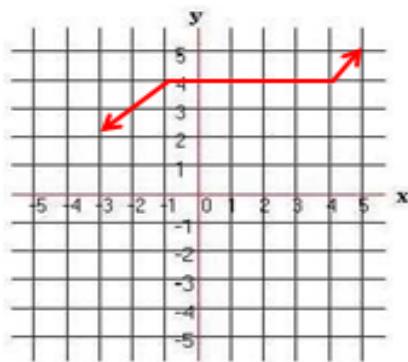
$$h(x) = g(x)$$

$$k(x) = 23$$

Find: $f(4) \cdot g(-1)$

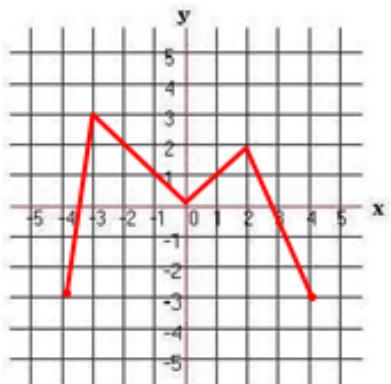


$f(x)$

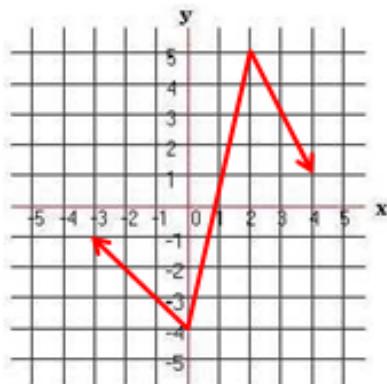


$g(x)$

Find: $f(-4) \cdot g(2)$



$f(x)$



$g(x)$

• • •

$$f(x) = 2x - 3$$

$$g(x) = 3x - 4$$

$$f(x) * g(x)$$

$$(2x-3) \cdot (3x-4)$$
$$6x^2 - 8x - 9x + 12$$
$$6x^2 - 17x + 12$$

$$f(x)/g(x)$$

$$\frac{2x-3}{3x-4}$$

$$\begin{aligned} h(x) &= x + 3 \\ k(x) &= 2x - 4 \end{aligned}$$



 $h \bullet k$ $h \div k$

$$f(x) = \frac{2x - 7}{3}$$

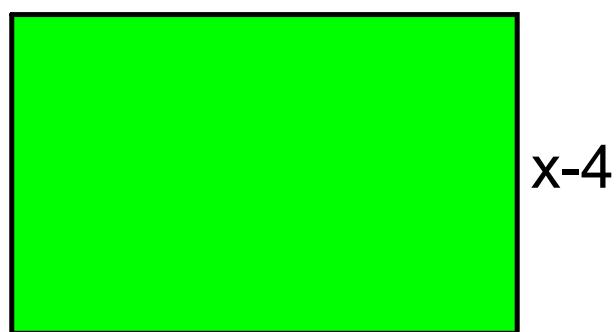
$$g(x) = 5x - 2$$



$$f \bullet g$$

$$\frac{f}{g}$$

Find the area



$$\begin{array}{r} x^2 + 3x - 2 \\ \hline (x-4)(x^2 + 3x - 2) \\ x^3 + 3x^2 - 2x \\ - 4x^2 - 12x + 8 \\ \hline x^3 - x^2 - 14x + 8 \end{array}$$

The diagram shows the multiplication of two polynomials. The first polynomial is $x^2 + 3x - 2$, labeled above the multiplication line. The second polynomial is $(x-4)$, which is circled in red. The terms of the second polynomial are also circled: x (yellow), -4 (blue), and $(x^2 + 3x - 2)$ (blue). The multiplication is performed using the distributive property (FOIL method). The result is $x^3 - x^2 - 14x + 8$, which is underlined in green.

Find the Area and Perimeter.

