

7.5
r.478

ex 2 $f(x) = -2x + 5$

a. $f(-1) = -2(-1) + 5$
 $= 2 + 5 = 7$

b. $f(2) = -2(2) + 5$
 $= -4 + 5 = 1$

ex 8 $f(x) = -x^2 - x^3 + 11x$

$= -1(x^2) - (x^3) + 11x$

a. $f(-1) = -1(-1)^2 - (-1)^3 + 11(-1)$
 $= -1(1) - (-1) + 11(-1)$
 $= -1 + 1 - 11 = -11$

b. $f(2) = -1(2)^2 - (2)^3 + 11(2)$
 $= -1(4) - 8 + 22$
 $= -4 - 8 + 22 = 10$

ex 10

$(f+g)(x)$ $f(x) = -4x + 1$ $\rightarrow f(x) + g(x)$ $= -4x + 1 + 6x + 2$ $= 2x + 3$	$(f-g)(x)$ $g(x) = 6x + 2$ $f(x) - g(x)$ $[-4x + 1] - [6x + 2]$ $-4x + 1 - 6x - 2$ $= -10x - 1$
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ex 12

$(f+g)(x)$ $f(x) = 3x^2 - 9x + 10$ $(f+g)(x)$ $= f(x) + g(x)$ $= 3x^2 - 9x + 10 - 4x^2 + 2x + 12$ $= -x^2 - 7x + 22$	$(f-g)(x)$ $g(x) = -4x^2 + 2x + 12$ $(f-g)(x) = f(x) - g(x)$ $= 3x^2 - 9x + 10 - [-4x^2 + 2x + 12]$ $= 3x^2 - 9x + 10 + 4x^2 - 2x - 12$ $= 7x^2 - 11x - 2$
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$$f(x) = x^2 - 9, g(x) = 2x, h(x) = x - 3$$

$$\text{ex 18 } (f+h)(x) = f(x) + h(x) \\ = x^2 - 9 + x - 3 = x^2 + x - 12$$

$$\text{ex 20 } (f+h)(-2) \qquad (-2)^2 + (-2) - 12 \\ = f(-2) + h(-2) \qquad 4 - 2 - 12 = -10 \\ = (-2)^2 - 9 + (-2) - 3 \\ = 4 - 9 - 2 - 3 \\ = -10$$

$$f(x) = x^2 - 9, g(x) = 2x, h(x) = x - 3$$

$$\text{ex 22 } (g-h)(10) \\ = g(10) - h(10) \\ = 2(10) - [10 - 3] \\ = 20 - 7 \\ = 13$$

$$(g+h)\left(-\frac{1}{4}\right) = \text{ex 28} \\ g\left(-\frac{1}{4}\right) + h\left(-\frac{1}{4}\right) = \\ 2\left(-\frac{1}{4}\right) - \frac{1}{4} - 3 \\ -\frac{2}{4} - \frac{1}{4} - 3 \\ -\frac{3}{4} - 3 \\ -3\frac{3}{4}$$

$$\text{find } (fg)(x) = f(x) \cdot g(x)$$

$$\text{ex 32 } f(x) = 3x \quad g(x) = 6x - 8$$

$$(fg)(x) = 3x(6x - 8) = 18x^2 - 24x$$

ex 34

$$f(x) = x - 7 \quad g(x) = 4x + 5$$

$$(fg)(x) = (x - 7)(4x + 5)$$

$$= 4x^2 + 5x - 28x - 35$$

$$= 4x^2 - 23x - 35$$

$$f(x) = x^2 - 9, \quad g(x) = 2x, \quad h(x) = x - 3$$

$$\text{ex 38 } (fh)(x) = f(x) \cdot h(x) = (x^2 - 9)(x - 3)$$

$$= x^3 - 3x^2 - 9x + 27$$

$$\text{ex 40 } (fh)(1)$$

$$= f(1) \cdot h(1)$$

$$= (1^2 - 9)(1 - 3)$$

$$= (-8)(-2)$$

$$= 16$$

$$1 - 3 - 9 + 27 = 16$$

$$f(x) = x^2 - 9, g(x) = 2x, h(x) = x - 3$$

ex 46 $(fg)\left(-\frac{1}{3}\right)$

$$f(x) \cdot g(x) = (x^2 - 9)(2x) = 2x^3 - 18x$$

$$(fg)\left(-\frac{1}{3}\right) = 2\left(-\frac{1}{3}\right)^3 - 18\left(-\frac{1}{3}\right) =$$

$$\frac{2}{1} \left(-\frac{1}{27}\right) + 6 = \frac{-2}{27} + 6 = 5\frac{25}{27}$$

ex 50 $\left(\frac{f}{g}\right)(x)$

$$\left(\frac{f}{g}\right)(x) = \frac{f(x)}{g(x)}$$

$$= \frac{18x^2 - 24x}{3x}$$

$$\boxed{x \neq 0}$$

$$f(x) = 18x^2 - 24x$$

$$g(x) = 3x$$

$$= \frac{\overset{2}{6} \cancel{3} (3x - 4)}{\underset{1}{\cancel{3x}}}$$

$$= 2(3x - 4) \text{ or } 6x - 8$$

$$f(x) = x^2 - 9, g(x) = 2x, h(x) = x - 3$$

$$\text{ex 56 } \left(\frac{f}{h}\right)(x) = \frac{f(x)}{h(x)} = \frac{x^2 - 9}{x - 3} = \frac{\cancel{(x-3)}(x+3)}{\cancel{x-3}}$$

$$\text{ex 58 } \left(\frac{f}{h}\right)(1) = 1 + 3 = 4 = x + 3$$

$$\frac{1^2 - 9}{1 - 3} = \frac{-8}{-2}$$

$$f(x) = x^2 - 9, g(x) = 2x, h(x) = x - 3$$

$$\left(\frac{f}{g}\right)\left(\frac{3}{2}\right) = \frac{\left(\frac{3}{2}\right)^2 - 9}{2\left(\frac{3}{2}\right)} = \frac{\frac{9}{4} - 9 \cdot 1}{3} = \frac{\frac{9}{4} - \frac{36}{4}}{3}$$

$$\frac{f(x)}{g(x)} = \frac{x^2 - 9}{2x} = \frac{-\frac{25}{4}}{3} = \frac{-25}{4} \div \frac{3}{1}$$

$$= \frac{-25}{4} \cdot \frac{1}{3} = \left(\frac{-25}{12}\right)$$

$$(f \circ g)(x) = f(g(x))$$
$$(g \circ f)(x) = g(f(x))$$

$$f(x) = x^2 + 4, \quad g(x) = 2x + 3, \quad h(x) = x - 5$$

ex 68 $(f \circ g)(4) = f(g(4))$

$$= f(2(4) + 3)$$
$$= f(11)$$
$$= 11^2 + 4$$
$$= 121 + 4 = \textcircled{125}$$

$$g(f(4)) = g(4^2 + 4)$$
$$= g(20)$$
$$= 2(20) + 3$$
$$= 43$$

$$f(x) = x^2 + 4, g(x) = 2x + 3, h(x) = x - 5$$

$$\text{ex 70} \quad (h \circ f)(6) = h(f(6)) = h(6^2 + 4)$$

$$= h(40) = 40 - 5 = 35$$

$$\text{ex 72} \quad (h \circ g)(-2) = h(g(-2)) = h(2(-2) + 3)$$
$$= h(-1) = -1 - 5 = -6$$

$$f(x) = x^2 + 4, g(x) = 2x + 3, h(x) = x - 5$$

$$\text{ex 76} \quad (g \circ h)(x) = g(h(x)) = g(x - 5)$$

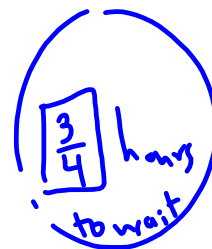
$$= 2(x - 5) + 3 = 2x - 10 + 3$$

$$= 2x - 7$$

$$f(x) = x^2 + 4, \quad g(x) = 2x + 3, \quad h(x) = x - 5$$

ex 80

$$\begin{aligned} (h \circ f)\left(\frac{1}{2}\right) &= h\left(f\left(\frac{1}{2}\right)\right) = h\left(\left(\frac{1}{2}\right)^2 + 4\right) \\ &= h\left(\frac{1}{4} + 4\right) = h\left(4\frac{1}{4}\right) = 4\frac{1}{4} - 5 = -\frac{3}{4} \end{aligned}$$



$$f(x) = \frac{x+5}{x^2+6x+5}$$

$$(x+5)(x+1)$$

$$x+5 \neq 0 \quad x+1 \neq 0$$

$$x \neq -5 \quad x \neq -1$$



$$\{x \mid x \neq -5 \text{ \& } x \neq -1\}$$

$$(-\infty, -5) \cup (-5, -1) \cup (-1, \infty)$$

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