Solutions

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2. The graphs of $y = f(x)$ and $y = g(x)$ are shown.

$y = f(x)$

$y = g(x)$
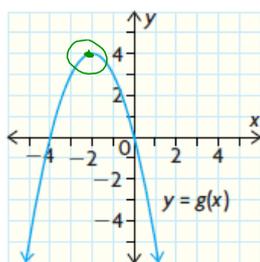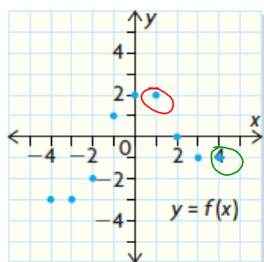
Using the graphs, evaluate

a) $f(1)$

when $x = 1$,

$y = 2$

$\Rightarrow f(1) = 2$

c) $f(4) - g(-2)$

when $x = 4, \ y = -1$

when $x = -2, \ y = 4$

$\Rightarrow f(4) = -1, \ g(-2) = 4$

$f(4) - g(-2)$

$= -1 - 4$

$= -5$

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7. For $h(x) = 2x - 5$, determine

a) $h(a)$

$= 2(a) - 5$

$= 2a - 5$

c) $h(3c - 1)$

$= 2(3c - 1) - 5$

$= 6c - 2 - 5$

$= 6c - 7$

b) $h(b + 1)$

$= 2(b + 1) - 5$

$= 2b + 2 - 5$

$= 2b - 3$

d) $h(2 - 5x)$

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

$= 4 - 10x - 5$

$= -10x - 1$

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9. Consider the function $f(s) = s^2 - 6s + 9$.

b) Determine each value.

v) $[f(2) - f(1)] - [f(1) - f(0)]$ 　　　vi) $[f(3) - f(2)] - [f(2) - f(1)]$

$f(0) = (0)^2 - 6(0) + 9 = 9$

$f(1) = (1)^2 - 6(1) + 9 = 4$

$f(2) = (2)^2 - 6(2) + 9 = 1$

$f(3) = (3)^2 - 6(3) + 9 = 0$

v) $[f(2) - f(1)] - [f(1) - f(0)]$

$= [1 - 4] - [4 - 9]$

$= -3 - (-5)$

$= 2$

vi) $[f(3) - f(2)] - [f(2) - f(1)]$

$= [0 - 1] - [1 - 4]$

$= -1 - (-3)$

$= 2$

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11. For $g(x) = 4 - 5x$, determine the input for x when the output of $g(x)$ is

a) -6 b) 2 c) 0 d) $\dfrac{3}{5}$

a) $4 - 5x = -6$
$\dfrac{-5x}{-5} = \dfrac{-10}{-5}$
$x = 2$

b) $4 - 5x = 2$
$\dfrac{-5x}{-5} = \dfrac{-2}{-5}$
$x = \dfrac{2}{5}$

c) $4 - 5x = 0$
$\dfrac{-5x}{-5} = \dfrac{-4}{-5}$
$x = \dfrac{4}{5}$

d) $4 - 5x = \dfrac{3}{5}$
$\dfrac{-5x}{-5} = \dfrac{-3\frac{2}{5}}{-5}$
$x = \dfrac{-17}{5} \div -5$
$x = \dfrac{-17}{5} \times \dfrac{1}{-5}$
$x = \dfrac{17}{25}$

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12. A company rents cars for $50 per day plus $0.15/km.
  a) Express the daily rental cost as a function of the number of kilometres travelled.
  b) Determine the rental cost if you drive 472 km in one day.
  c) Determine how far you can drive in a day for $80.

Let $C =$ daily rental cost in dollars
and $n = $ # of km travelled

a) $C = 50 + 0.15n$

b) $C = 50 + 0.15(472)$
$C = 50 + 70.8$
$C = \$120.80$

c) $80 = 50 + 0.15n$
$\dfrac{30}{0.15} = \dfrac{0.15n}{0.15}$ $\Rightarrow n = 200 km$

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16. Let $f(x) = x^2 + 2x - 15$. Determine the values of x for which

    a) $f(x) = 0$ b) $f(x) = -12$ c) $f(x) = -16$

a) $x^2 + 2x - 15 = 0$

$(x + 5)(x - 3) = 0$

$x = -5, x = 3$

b) $x^2 + 2x - 15 = -12$

$x^2 + 2x - 3 = 0$

$(x + 3)(x - 1) = 0$

$x = -3, x = 1$

c) $x^2 + 2x - 15 = -16$

$x^2 + 2x + 1 = 0$

$(x + 1)(x + 1) = 0$

$x = -1$

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