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Functions

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Examples

Workout

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Question 1: Given $f(x) = 3x + 5$

Work out the values of

(a) $f(2)$ (b) $f(8)$ (c) $f(0)$ (d) $f(-2)$

Question 2: Given $g(x) = \dfrac{2x + 9}{4}$

Work out the values of

(a) $g(6)$ (b) $g(-1)$ (c) $g(0)$ (d) $g(-10)$

Question 3: Given $h(x) = x^2 - 5$

Work out the values of

(a) $h(7)$ (b) $h(-1)$ (c) $h(-3)$ (d) $h(15)$

Question 4: The function f is such that $f(x) = 3x - 8$

Solve $f(x) = 7$

Question 5: The function g is such that $g(x) = 19 - 4x$

Solve $g(x) = 31$

Question 6: The function h is such that $h(x) = \dfrac{5x - 1}{2}$

Solve $h(x) = 32$

Question 7: The function f is such that $f(x) = x^2 - 2x + 3$

Solve $f(x) = 27$

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Question 8: The functions $f(x)$ and $g(x)$ are given by the following:

$$f(x) = x + 5$$
$$g(x) = 3x - 1$$

Calculate the value of:

(a) $fg(1)$ (b) $fg(-5)$ (c) $gf(4)$ (d) $gf(0)$

(e) $ff(2)$ (f) $ff(-4)$ (g) $gg(10)$ (h) $gg(-2)$

Question 9: The functions $f(x)$, $g(x)$ and $h(x)$ are given by the following:

$$f(x) = x^2 + 7$$
$$g(x) = 3x - 8$$
$$h(x) = \frac{x}{4}$$

Calculate the value of:

(a) $fg(3)$ (b) $hf(5)$ (c) $gh(20)$ (d) $gf(-2)$

(e) $fh(12)$ (f) $ff(1)$ (g) $gg(4)$ (h) $hh(40)$

Question 10: The functions $f(x)$, $g(x)$ and $h(x)$ are given by the following:

$$f(x) = \frac{32}{x^2} \qquad g(x) = 2x^3 \qquad h(x) = \frac{12 - 2x}{5}$$

Calculate the value of:

(a) $fg(1)$ (b) $gf(4)$ (c) $gh(-19)$ (d) $hf(2)$

(e) $ff(2)$ (f) $ggg(1)$ (g) $hgf(8)$ (h) $hgh(6)$

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Question 11: The functions $f(x)$ and $g(x)$ are given by the following:

$$f(x) = 2x + 1$$
$$g(x) = x - 5$$

Find:

(a) $fg(x)$ (b) $gf(x)$ (c) $ff(x)$ (d) $gg(x)$

Question 12: The functions $f(x)$, $g(x)$ and $h(x)$ are given by the following:

$$f(x) = 4x - 3 \qquad g(x) = 2x + 6 \qquad h(x) = x^2$$

Find

(a) $fg(x)$ (b) $gf(x)$ (c) $hf(x)$ (d) $fh(x)$

(e) $hg(x)$ (f) $gh(x)$ (g) $fgh(x)$ (h) $hgf(x)$

Question 13: Find $f^{-1}(x)$ for each of the following:

(a) $f(x) = 2x$ (b) $f(x) = x - 6$ (c) $f(x) = \frac{x}{3}$

(d) $f(x) = 5x + 1$ (e) $f(x) = \frac{2x}{7}$ (f) $f(x) = \frac{x-2}{6}$

Question 14: Given $h(x) = \frac{x}{4}$

(a) Find $h^{-1}(x)$

(b) Calculate the value of $h^{-1}(1.5)$

Question 15: Given $f(x) = 2x - 3$

(a) Find $f^{-1}(x)$

(b) Calculate the value of $f^{-1}(7)$

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Question 16: Given $g(x) = \dfrac{3x+1}{2}$

(a) Find $g^{-1}(x)$

(b) Calculate the value of $g^{-1}(11)$

Question 17: Given $f(x) = \dfrac{4x}{9} - 8$

(a) Find $f^{-1}(x)$

(b) Calculate the value of $f^{-1}(-10)$

Apply

Question 1: Given $f(x) = 5x + 7$ and $g(x) = 3x - 18$

Find the value of a such that $f(a) = g(a)$

Question 2: Given $f(x) = x^2 + 9$ and $g(x) = x + 21$

Find the values of a such that $f(a) = g(a)$

Question 3: Given $f(x) = \dfrac{x+1}{3}$ and $g(x) = \dfrac{2}{x+2}$

Find the values of a such that $f(a) = g(a)$

Question 4: Given $f(x) = x^2 + 4x - 1$

Express the following in the form $ax^2 + bx + c$

(a) $f(x+2)$ (b) $f(x-1)$ (c) $f(2x)$

(d) $f(3x)$ (e) $f(2x-1)$ (f) $f(4x+3)$

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Question 5: The function f is such that $f(x) = kx + 7$

The function g is such that $g(x) = 3x - 2$

Given that $gf(1) = 34$

Work out the value of k

Question 6: The function g is such that $f(x) = \frac{kx + 2}{4}$

The function h is such that $g(x) = 2x + 5$

Given that $fg(4) = -9.25$

Work out the value of k

Question 7: For all values of x

$$f(x) = x^2 + 5$$

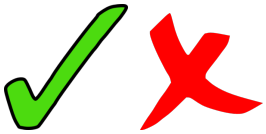
$$g(x) = x - 4$$

Solve $fg(x) = gf(x)$

Question 8: $f(x) = x^2 + 3x + 8$

Show that $f(x + 1) - f(x) = 2x + 4$

Answers



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