

3UI - Function Notation Worksheet for Group Work

KEY

In your groups:

1. Think of a number, triple it, subtract the resulting number from 24. Finally, multiply the resulting difference by the number you first thought of.
- a) Use function notation to write the result as a function of the number you first thought of.

$$f(x) = x(24 - 3x)$$

- b) Solve your function above if the number Kim thought of was

a. 5

b. -1

$$\begin{aligned} a) f(5) &= 5(24 - 3(5)) \\ &= 5(24 - 15) \\ &= 5(9) \\ &= 45 \end{aligned}$$

$$\begin{aligned} b) f(-1) &= -1(24 - 3(-1)) \\ &= -1(24 + 3) \\ &= -1(27) \\ &= -27 \end{aligned}$$

2. Evaluate the following expressions given the functions below:

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

$$f(x) = x^2 + 7$$

$$h(x) = \frac{12}{x}$$

$$j(x) = 2x + 9$$

$$\begin{aligned} a. g(10) &= -3(10) + 1 \\ &= -30 + 1 \\ &= -29 \end{aligned}$$

$$\begin{aligned} f. g(b+c) &= -3(b+c) + 1 \\ &= -3b - 3c + 1 \end{aligned}$$

$$\begin{aligned} b. f(3) &= (3)^2 + 7 \\ &= 9 + 7 \\ &= 16 \end{aligned}$$

$$\begin{aligned} g. \text{ (optional) } f(h(x)) &= x^2 + 7 \\ &= \left(\frac{12}{x}\right)^2 + 7 \\ &= \frac{144}{x^2} + \frac{7x}{x} = \frac{2x^2 + 144}{x} \end{aligned}$$

$$c. h(-2) = \frac{12}{-2} = -6$$

$$\begin{aligned} h. \text{ Find } x \text{ if } g(x) &= 16 \\ 16 &= -3x + 1 \\ 15 &= -3x \\ -5 &= x \end{aligned}$$

$$\begin{aligned} d. j(7) &= 2(7) + 9 \\ &= 14 + 9 \\ &= 23 \end{aligned}$$

$$\begin{aligned} i. \text{ Find } x \text{ if } h(x) &= -2 \\ \frac{12}{x} &= -2 \\ 12 &= -2x \\ \frac{12}{-2} &= x \\ x &= -6 \end{aligned}$$

$$e. h(a) = \frac{12}{a}$$

$$\begin{aligned} j. \text{ Find } x \text{ if } f(x) &= 23 \\ 23 &= x^2 + 7 \\ 23 - 7 &= x^2 \\ 16 &= x^2 \\ x &= \pm \sqrt{16} \\ x &= \pm 4 \end{aligned}$$

3. Translate the following statements into coordinate points:

a. $f(-1) = 1$
 $(-1, 1)$

c. $g(1) = -1$
 $(1, -1)$

b. $h(2) = 7$
 $(2, 7)$

d. $k(3) = 9$
 $(3, 9)$