Tue 15 JAN 2019

PRACTICE

1) Given $f(x) = (x-1)(x+1)$. Write the expression of following functs:

$x^2+x-x-1$

a) $g(x) = 3f(x-2)+1$

b) $h(x) = \frac{2}{5}g(x+2)+\frac{3}{5}$

b) $g(x+2) =$.

ANS:

$f(x) = x^2-1$ ← Simplify

$f(x-2) = (x-2)^2-1$ ← Evaluate what you need

a) $g(x) = 3[(x-2)^2-1]+1$ ← substitute

$= 3(x-2)^2-3+1 = \boxed{3(x-2)^2-2}$

2) Given $f(x) = 3(x+1)^2$. Evaluate

a) $f(\boxed{x+1}) = 3(x+1+1)^2 = 3(x+2)^2$

b) $f(x-3) = 3(x-3+1)^2 = 3(x-2)^2$

c) $f(3x+2) = 3(3x+2+1)^2 = 3(3x+3)^2$

$= 3 \cdot 9\,(x+1)^2$

$= 27\,(x+1)^2$

d) $f\left(\frac{x-1}{7}\right)$

e) $f\left(\frac{2x+1}{3}\right)$

$\therefore$

$(3x+3)^2 = [3(x+1)]^2 = 3^2 \cdot (x+1)^2$

(cont.) $f(x) = 3(x+1)^2$

d) $f\left(\frac{x-1}{7}\right) = 3\left(\frac{x-1}{7} + 1\right)^2 = 3\left(\frac{x-1}{7} + \frac{7}{7}\right)^2 =$

$= 3\left(\frac{x-1+7}{7}\right)^2 = 3\left(\frac{x+6}{7}\right)^2 = 3\frac{(x+6)^2}{49}$

$= \frac{3}{49}(x+6)^2$

$\frac{3}{5} + 2 = \frac{3}{5} + \frac{10}{5}$

$= \frac{13}{5}$

$\therefore$

$$\text{e) } f\left(\frac{2x+1}{3}\right) = 3\left(\frac{2x+1}{3}+1\right)^2 = 3\left(\frac{2x+1}{3}+\frac{3}{3}\right)^2 =$$

$$= 3\left(\frac{2x+4}{3}\right)^2 = 3\,\frac{(2x+4)^2}{9} = \frac{1}{3}(2x+4)^2 =$$

$$= \frac{1}{3}\left[2(x+2)\right]^2 = \frac{1}{3}\cdot 4\cdot (x+2)^2 = \boxed{\frac{4}{3}(x+2)^2}$$

$(3\cdot 5)^2 = 15^2$

$3^2\cdot 5^2 = 9\cdot 25$