Name:_____

Functions HW

1. State the domain and range for each relation and state if it is a function

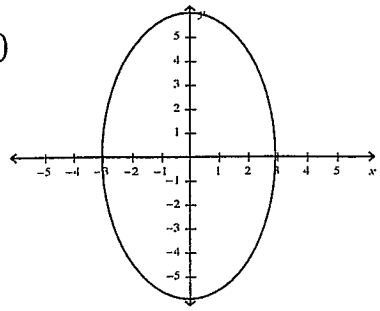
a) (8, 17), (5, 5), (8, −3), (4, −1)}

Domain: {x | 8, 5, 4}

Range: {y | 17, 5 −3, −1}

Function: NO

b)

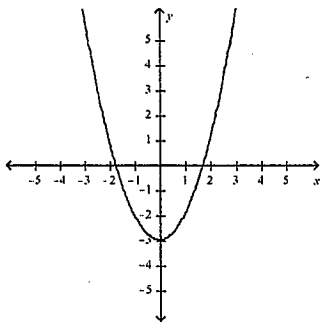


Domain: {x | −3 ≤ x ≤ 3, x ∈ R}

Range: {y | −6 ≤ y ≤ 6, y ∈ R}

Function: NO

c)

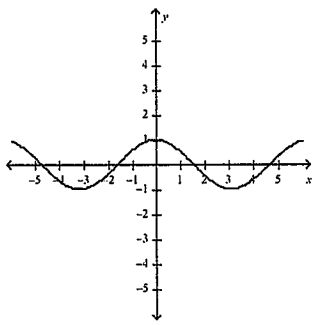


Domain: {x | x ∈ R}

Range: {y | y ≥ −3, y ∈ R}

Function: yes

d)

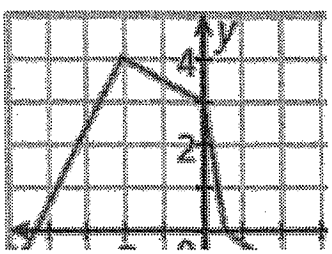


Domain: {x | x ∈ R}

Range: {y | −1 ≤ y ≤ 1, y ∈ R}

Function: yes

1. The graph of $y = f(x)$ is shown .



a) Evaluate f(-2)= 4

b) f(0) +f(2) = 3 + (−1) = 2

c) x when f(x) = 4 x = 2

d) x when f(x) = 0 3

2. Given $f(x) = 4x^2 - 1$ $\quad g(x) = 3x + 2$ $\quad h(x) = \dfrac{2}{x+1}$

a) $g(7)$

$= 23$

b) $f(2\sqrt{2})$

$4(2\sqrt{2})^2 - 1$

$= 4(4(2)) - 1$

$= 32 - 1$

$= 31$

c) $f(g(x))$

$= 4(3x+2)^2 - 1$

$= 4(3x+2)(3x+2) - 1$

$4(9x^2 + 12x + 4) - 1$

$= 36x^2 + 48x + 16 - 1$

$= 36x^2 + 48x + 15$

d) $h\left(\dfrac{1}{2}\right)$

$\dfrac{2}{\frac{1}{2}+1}$

$= \dfrac{2}{\frac{3}{2}}$

$= \dfrac{2}{1} \div \dfrac{3}{2}$

$= \dfrac{2}{1} \times \dfrac{2}{3}$

$= \dfrac{4}{3}$

e) $g(h(3))$

$h(3) = \dfrac{2}{4}$

$= \dfrac{1}{2}$

$= 3\left(\frac{1}{2}\right) + 2$

$= \dfrac{3}{2} + \dfrac{2}{1}$

$= \dfrac{3}{2} + \dfrac{4}{2} = \dfrac{7}{2}$

f) $g(x^2) - f(2x)$

$= 3(x^2) + 2 - (4(2x)^2 - 1)$

$= 3x^2 + 2 - 16x^2 + 1$

$= -13x^2 + 3$

3. Find the value of x if:

a) $f(2x) = 0$

$4(2x)^2 - 1 = 0$

$16x^2 - 1 = 0$

$16x^2 = 1$

$x^2 = \dfrac{1}{16}$

$x = \pm\dfrac{1}{4}$