

**Relations and Functions****A. State for each of the following relations whether y is a function of x.**

1.  $y = \sqrt{-11-15x}$
2.  $14 + 10x^2 = 7y^2$
3.  $86 = 6y^2 + 11x^2$
4.  $10 = x^2 + y - 1$
5.  $4y^2 = 12 - 10x^2$
6.  $14y^2 + 14 = x$
7.  $6 = x^2 + 1 - y$
8.  $-3x^2 = -8y$
9.  $x = |-15y - 11|$
10.  $-14x^2 + y - x = -14x^2 - 40$
11.  $13 + 11y^3 = x$
12.  $8y = 5x^2$
13.  $97 = 4y^2 + 13x^2$

**B. State the domain and range for each. Is the relation a function?**

1.  $\{(-4,-3),(-8,-7), (6,-8),(-3, -9), (7, -5)\}$
2.  $\{(0, 6), (3, 1), (-2, 5), (-6, 4), (6, 1), (9, 1)\}$
3.  $\{(5, -1), (-5, -1), (2, -4)\}$
4.  $\{(5, 3), (7, 7), (7, 6), (-5, -3), (5, -5), (-8, -6)\}$
5.  $\{(14, -132), (52, 109), (6, -132), (-24, -92)\}$
6.  $\{(36, 71), (36, 71), (35, -26), (36, -46), (36, -84), (36, -26)\}$
7.  $\{(9.97, -41.78), (93.28, -41.78), (-13.61, -41.78), (74.64, -30.87)\}$
8.  $\{(167, 171), (-30, -124), (85, -124), (131, -141), (69, -141), (157, -124)\}$

**C. Functional values**

1.  $f(x) = -11x^2 - 7x + 14$ , find  $f(10)$
2.  $f(x) = 9x^2 - 8x - 8$ , find  $f(10)$

3.  $f(x) = -15x^2 + 9$ , find  $f(12)$
4.  $f(x) = 5x^3 + 5x^2$ , find  $f(-9)$
5.  $f(x) = -8x + 14 + 15x^2$ , find  $f(9)$
6.  $f(x) = 13x^3 - 9x^4 - 10x$ , find  $f(-2)$
7.  $f(x) = 15x - 15x^2$ , find  $f(4)$
8.  $f(x) = 13x + 7x^2$ , find  $f(-8)$
9.  $f(x) = 3x + 11 + 10x^2$ , find  $f(-3)$

**D. State the domain and range for each.**

1.  $y = 88(6x - 9)^2$
2.  $y = |5x - 12|$
3.  $y = 67 - 8x^2$
4.  $y = -3x^3 + 7$
5.  $y = (10x - 2)^3 - 85$

**E. State the domain and range for each. Is the relation a function?**

1.  $\{(2.5, -0.5), (3.6, -8.2), (-5.8, -0.5), (-0.3, -0.5), (5.1, 1.4)\}$
2.  $\{(0, 9), (1, 7), (3, -3), (-3, -1)\}$
3.  $\{(3, 4), (8, -7), (6, -4), (8, 8), (3, -2), (5, 4)\}$
4.  $\{(2, -9), (5, 3), (3, 4), (-6, -9)\}$
5.  $\{(2, -3), (-4, -3), (5, -3), (8, -3), (1, -3)\}$
6.  $y = -10x^3 + 2$
7.  $y = (11x + 2)^3 - 175$
8.  $y = x^2 + 4$