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. $y = x^2 + 4$