Mathematics Questionnaire - Set 3

1. Evaluate: lim (x -> 3) (x^2 - 9) / (x - 3)

   a) 3 b) 6 c) 9 d) Does not exist

2. Evaluate: lim (x -> inf) (5x^2 + 3) / (2x^2 - 7)

   a) 5/2 b) 3/7 c) 0 d) Infinity

3. The limit lim (x -> 0) (sin x) / x is equal to 1. (True/False)

4. What is the equation of a circle with center at (2, -3) and radius 4?

   a) (x + 2)^2 + (y - 3)^2 = 4

   b) (x - 2)^2 + (y + 3)^2 = 16

   c) (x - 2)^2 + (y + 3)^2 = 4

   d) (x + 2)^2 + (y - 3)^2 = 16

5. The equation ((x - 1)^2 / 4) + ((y + 2)^2 / 9) = 1 represents which conic section?

   a) Circle b) Ellipse c) Hyperbola d) Parabola

6. Find the focus of the parabola: y = (1/4)(x - 2)^2 + 3

   a) (2, 4) b) (2, 3.25) c) (2, 2.75) d) (2, 3)

7. Find the vertical asymptote of f(x) = (x + 3) / (x^2 - 4)

   a) x = -3 b) x = 2 c) x = -2, 2 d) None

8. What is the horizontal asymptote of f(x) = (4x^3 - 2) / (x^3 + 5x)?

   a) y = 4 b) y = 0 c) y = 4/1 d) No horizontal asymptote

9. Find the removable discontinuity (hole) of f(x) = ((x - 2)(x + 3)) / ((x - 2)(x - 5))

   a) x = -3 b) x = 2 c) x = 5 d) No removable discontinuity

10. What is sin(45°)?

    a) sqrt(2)/2 b) sqrt(3)/2 c) 1/2 d) 1

11. What is tan(30°)?

    a) 1/sqrt(3) b) sqrt(3) c) sqrt(3)/3 d) 1

12. What is the reference angle of 210°?

a) 30° b) 45° c) 60° d) 90°

13. Find the exact value of cos(330°).

a) sqrt(3)/2 b) -sqrt(3)/2 c) 1/2 d) -1/2

14. The angle 5pi/6 is in which quadrant?

a) I b) II c) III d) IV

15. If sin theta = -1/2, and theta is in quadrant III, what is cos theta?

a) sqrt(3)/2 b) -sqrt(3)/2 c) 1/2 d) -1/2