MAT 107 TEST #3 REVIEW G.BUTHUSIEM

Find the focus and the directrix of the parabola.

1. $y = -2x^2 - 16x - 31$

Find the equation of the parabola determined by the given information.

2. Vertex at the origin, focus at $(0, -5)$

Find the focus and the directrix of the parabola.

3. $y = -2x^2 - 20x - 49$

Write the equation for the circle described.

4. Center at $(5, 4)$, radius 3

Identify the equation as a parabola, ellipse, or circle.

5. $9x^2 + 4y^2 = 36$

6. $7y^2 + 3x^2 = 3 - x$

Find the foci and asymptotes of the hyperbola.

7. $\frac{x^2}{64} - \frac{y^2}{36} = 1$

Use completing the square to rewrite the equation in one of the standard forms for a conic and identify the conic.

8. $x^2 + y^2 + 4x - 6y + 1 = 0$

9. $x^2 + 14x - y + 42 = 0$

Write a formula for the nth term of the infinite sequence. Do not use a recursion formula.

10. $1, \frac{1}{4}, \frac{1}{9}, \frac{1}{16}, \frac{1}{25}, \ldots$

Find the sum of the series.

11. $\sum_{i=1}^{5} (3i - 2)$

Find the requested sum of the series.

12. $\sum_{i=1}^{8616} i$

Find the common ratio for the geometric sequence.

13. 3, 6, 12, 24, 48

Find the sum of the geometric series.

14. $1 + \frac{1}{4} + \frac{1}{16} + \frac{1}{64} + \frac{1}{256}$

Identify the sequence as arithmetic, geometric, or neither.

15. 2, 8, 32, 128, 512, . . .

Determine if the given sequence could be an arithmetic sequence.

16. 0, 3, 6, 9, 12, . . .

Use completing the square to rewrite the equation in one of the standard forms for a conic and identify the conic.

17. $7x^2 - 5y^2 - 14x + 40y - 108 = 0$

Identify the equation as a parabola, ellipse, or circle.

18. $x^2 + y^2 = 36$

1. $\left(-4, \frac{7}{8}\right)$; $y = \frac{9}{8}$
2. $y = -\frac{1}{20}x^2$
3. $\left(-5, \frac{7}{8}\right)$; $y = \frac{9}{8}$
4. $(x - 5)^2 + (y - 4)^2 = 9$
5. Ellipse
6. Ellipse
7. $(-10, 0)$, $(10, 0)$; $y = \frac{3}{4}x$, $y = -\frac{3}{4}x$
8. $(x + 2)^2 + (y - 3)^2 = 12$; circle
9. $y = (x + 7)^2 - 7$; parabola
10. $a_n = \frac{1}{n^2}$
11. 35
12. 37,122,036
13. 2
14. $\frac{341}{256}$
15. Geometric
16. Yes
17. $\frac{(x - 1)^2}{5} - \frac{(y - 4)^2}{7} = 1$; hyperbola
18. Circle