

Practice for Semester Exam

Date_____ Period_____

Use the information provided to write the standard form equation of each ellipse.

1) $x^2 + 25y^2 - 4x - 200y + 304 = 0$

Identify the center, vertices, and co-vertices of each ellipse.

2) $\frac{(x+3)^2}{225} + \frac{(y-9)^2}{9} = 1$

Use the information provided to write the standard form equation of each hyperbola.

3) $4x^2 - y^2 - 8x - 2y - 141 = 0$

Identify the vertices and direction of opening of each hyperbola.

4) $\frac{(x+2)^2}{175} - \frac{(y-4)^2}{95} = 1$

Identify the asymptotes of each hyperbola.

5) $\frac{(y+7)^2}{115} - \frac{(x-9)^2}{100} = 1$

Use the information provided to write the standard form equation of each circle.

6) Center: $(-6, 4)$

Radius: 13

Identify the vertices and foci of each. Then sketch the graph.

7) $\frac{(x-1)^2}{16} + \frac{(y-1)^2}{36} = 1$

Classify each conic section.

8) $x^2 + y^2 - 6x + 2y - 6 = 0$

9) $2y^2 + x - 1 = 0$

10) $x^2 + 9y^2 - 6x + 72y + 144 = 0$

11) $-x^2 + 25y^2 + 50y = 0$

Classify each conic section, write its equation in standard form, and sketch its graph.

12) $x^2 + y^2 + 6x + 8y + 20 = 0$

13) $3x^2 + 4y^2 - 6x - 8y - 53 = 0$

Solve each question. Round your answer to the nearest hundredth.

- 14) Maria can tar a roof in 14 hours. Beth can tar the same roof in 12 hours. If they worked together how long would it take them?

- 15) Eugene can harvest a field in 13 hours. DeShawn can harvest the same field in 8 hours. How long would it take them if they worked together?

- 16) Julio and his brother mixed together some soil and some clay to make 15 ft
- ³
- of soil with a 68% clay content. They used 7 ft
- ³
- of clay and 8 ft
- ³
- of a soil they purchased. What was the clay content of the soil they purchased?

- 17) Julia asked you to make 12 L of fruit punch that contains 20% fruit juice by mixing together some amount of Brand A fruit punch and some amount of Brand B fruit punch. Brand A contains 10% fruit juice and Brand B contains 40% fruit juice. How much of each do you need?

- 18) The difference of two numbers is 4. Their sum is 16. What are the numbers?
- 19) Ryan and Cody are selling pies for a school fundraiser. Customers can buy cherry pies and pumpkin pies. Ryan sold 3 cherry pies and 12 pumpkin pies for a total of \$282. Cody sold 2 cherry pies and 1 pumpkin pie for a total of \$48. Find the cost each of one cherry pie and one pumpkin pie.

Solve each system of equations.

$$\begin{aligned} 20) \quad & 5x^2 + 4y^2 + 2x - 33y + 26 = 0 \\ & x - 3y + 4 = 0 \end{aligned}$$

Determine if the sequence is arithmetic. If it is, find the common difference d .

21) 37, 39, 41, 43, ...

Determine if the sequence is arithmetic. If it is, find the common difference d and the next 3 terms.

22) 37, 33, 29, 25, ...

Determine if the sequence is arithmetic. If it is, find the term named in the problem.

23) 0, -4, -8, -12, ...
Find a_{32}

Find the 52nd term.

24) 32, 62, 92, 122, ...

Given two terms in an arithmetic sequence find the term named in the problem.

25) $a_{14} = 111$ and $a_{37} = 295$
Find a_{32}

Given a term in an arithmetic sequence and the common difference find the term named in the problem.

26) $a_{31} = 163$, $d = 6$
Find a_{24}

Evaluate each arithmetic series described, that is, find the partial sum of the series.

27) $a_1 = 26$, $a_n = 134$, $n = 13$

Determine the number of terms n in each arithmetic series.

28) $a_1 = -46$, $a_n = -82$, $S_n = -320$

Determine if the sequence is geometric. If it is, find the common ratio and the 8th term.

29) -3, 6, -12, 24, ...

Given the first term and the common ratio of a geometric sequence find the term named in the problem.

30) $a_1 = 2$, $r = -2$
Find a_{12}

Evaluate each geometric series described.

31) $-3 - 18 - 108 - 648 \dots$, $n = 6$

Answers to Practice for Semester Exam (ID: 12)

1) $\frac{(x-2)^2}{100} + \frac{(y-4)^2}{4} = 1$

2) Center: $(-3, 9)$
 Vertices: $(12, 9), (-18, 9)$
 Co-vertices: $(-3, 12), (-3, 6)$

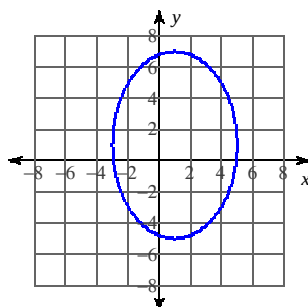
3) $\frac{(x-1)^2}{36} - \frac{(y+1)^2}{144} = 1$

4) Vertices: $(-2 + 5\sqrt{7}, 4), (-2 - 5\sqrt{7}, 4)$
 Opens left/right

5) $y = \frac{x\sqrt{115}}{10} - 7 - \frac{9\sqrt{115}}{10}$
 $y = -\frac{x\sqrt{115}}{10} - 7 + \frac{9\sqrt{115}}{10}$

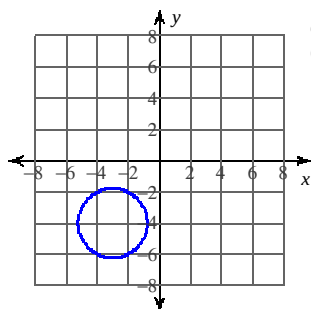
6) $(x+6)^2 + (y-4)^2 = 169$

7)



Vertices: $(1, 7)$
 $(1, -5)$
 Foci: $(1, 1 + 2\sqrt{5})$
 $(1, 1 - 2\sqrt{5})$

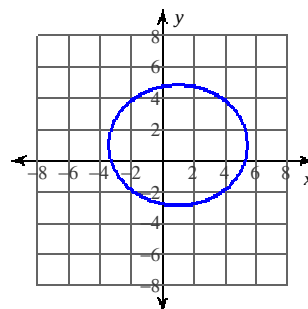
8) Circle
 12)



Circle
 $(x+3)^2 + (y+4)^2 = 5$

9) Parabola

10) Ellipse
 13)



11) Hyperbola

Ellipse
 $\frac{(x-1)^2}{20} + \frac{(y-1)^2}{15} = 1$

14) 6.46 hours

15) 4.95 hours

16) 40%

17) 8 L of Brand A, 4 L of Brand B

18) 6 and 10

19) cherry pie: \$14, pumpkin pie: \$20

20) $(2, 2), (-1, 1)$

21) $d = 2$

22) Common Difference: $d = -4$
 Next 3 terms: 21, 17, 13

23) $a_{32} = -124$

24) $a_{52} = 1562$

25) $a_{32} = 255$

26) $a_{24} = 121$

27) 1040

28) 5

29) Common Ratio: $r = -2$
 $a_8 = 384$

30) $a_{12} = -4096$

31) -27993