

## Sequences and Series - Chap 11

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**Find the next three terms in each sequence.**

1)  $-4, 26, -124, 626, -3124, \dots$

2)  $-2, -\frac{1}{2}, 1, \frac{5}{2}, 4, \dots$

**Find the tenth term in each sequence.**

3)  $4, 12, 36, 108, 324, \dots$

4)  $0, \frac{3}{2}, 3, \frac{9}{2}, 6, \dots$

5)  $a_n = -5 \cdot \left(\frac{1}{2}\right)^{n-1}$

6)  $a_n = a_{n-1} \cdot 2$   
 $a_1 = 2$

**Determine if the sequence is arithmetic. If it is, find the common difference, the 52nd term, and the explicit formula.**

7)  $36, 31, 26, 21, \dots$

8)  $37, 41, 45, 49, \dots$

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

9)  $-1, -3, -9, -27, \dots$

10)  $2, -8, 32, -128, \dots$

**Find the missing term or terms in each arithmetic sequence.**

11)  $\dots, 33, \underline{\hspace{1cm}}, 21, \dots$

12)  $\dots, 16, \underline{\hspace{1cm}}, 12, \dots$

**Find the missing term or terms in each geometric sequence.**

13)  $\dots, -3, \underline{\hspace{1cm}}, -75, \dots$

14)  $\dots, -4, \underline{\hspace{1cm}}, -100, \dots$

Evaluate each series.

15)  $\sum_{k=1}^6 k(k-1)$

16)  $\sum_{a=1}^6 a$

Rewrite each series using sigma notation.

17)  $5 + 25 + 125 + 625 + 3125$

18)  $5 + 25 + 125 + 625 + 3125 + 15625$

Evaluate the related series of each sequence.

19)  $-4, -6, -8, -10$

20)  $0, 4, 8, 12, 16$

Evaluate each geometric series described.

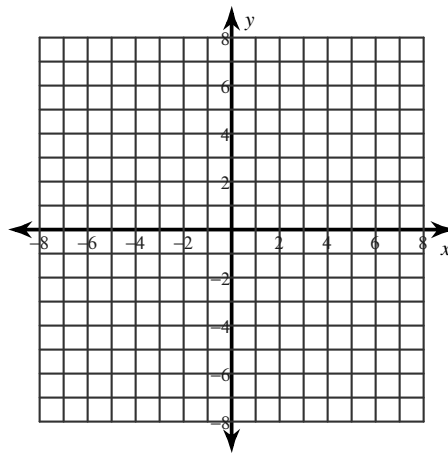
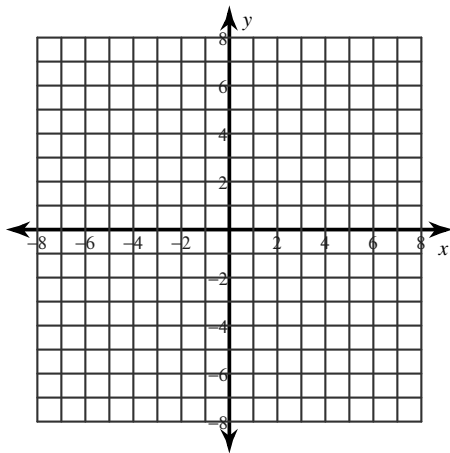
21)  $-1 + 4 - 16 + 64\dots, n = 6$

22)  $-1 + 6 - 36 + 216\dots, n = 7$

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

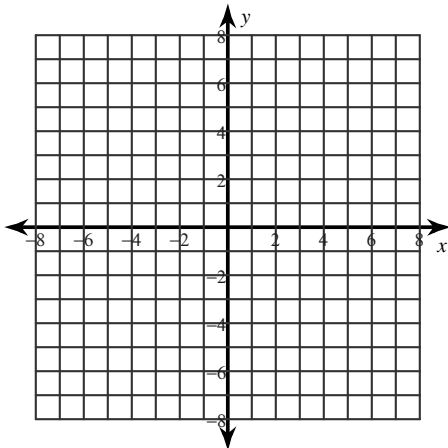
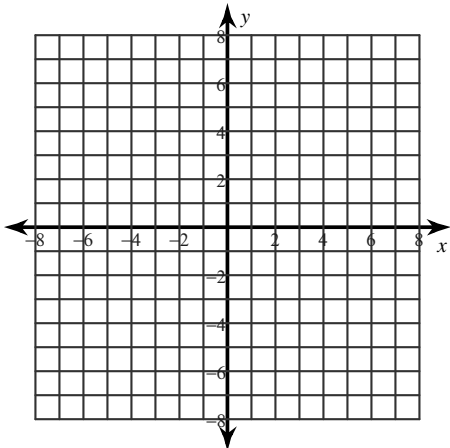
23)  $2x^2 - 12x + y + 19 = 0$

24)  $2y^2 + x - 24y + 68 = 0$

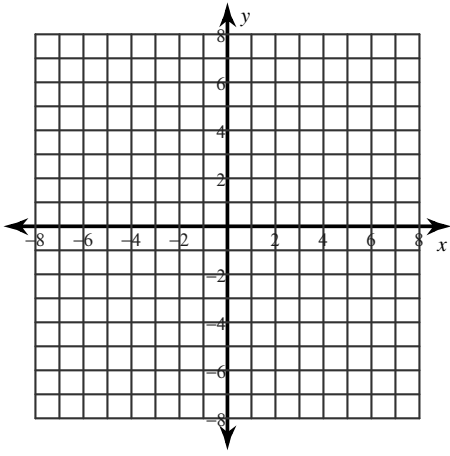


25)  $x^2 + y^2 + 4x - 4y - 16 = 0$

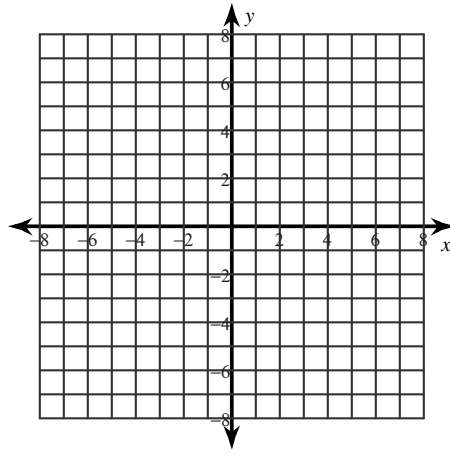
26)  $x^2 + y^2 - 6x + 2y + 9 = 0$



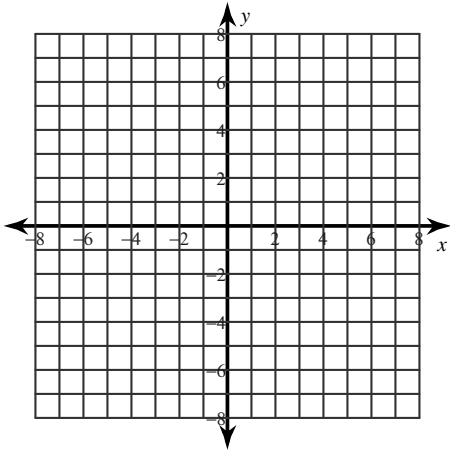
$$27) 9x^2 + 4y^2 + 18x + 32y + 37 = 0$$



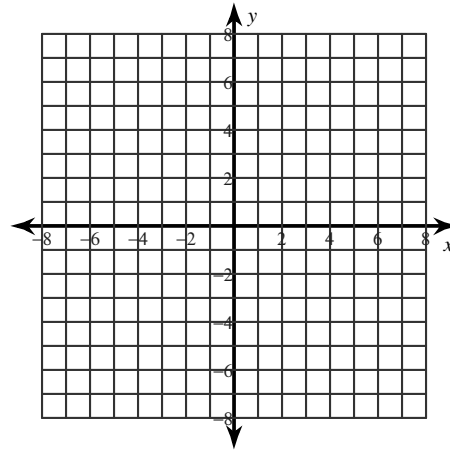
$$28) 25x^2 + 16y^2 - 100x - 64y - 236 = 0$$



$$29) x^2 - 9y^2 + 2x + 54y - 89 = 0$$



$$30) 25x^2 - 16y^2 - 400 = 0$$



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**Find the next three terms in each sequence.**

1)  $-4, 26, -124, 626, -3124, \dots$   
 $15626, -78124, 390626$

2)  $-2, -\frac{1}{2}, 1, \frac{5}{2}, 4, \dots$   $\frac{11}{2}, 7, \frac{17}{2}$

**Find the tenth term in each sequence.**

3)  $4, 12, 36, 108, 324, \dots$   
 $a_{10} = 78732$

4)  $0, \frac{3}{2}, 3, \frac{9}{2}, 6, \dots$   $a_{10} = \frac{27}{2}$

5)  $a_n = -5 \cdot \left(\frac{1}{2}\right)^{n-1}$   $a_{10} = -\frac{5}{512}$

6)  $a_n = a_{n-1} \cdot 2$   
 $a_1 = 2$   
 $a_{10} = 1024$

**Determine if the sequence is arithmetic. If it is, find the common difference, the 52nd term, and the explicit formula.**

7)  $36, 31, 26, 21, \dots$

Common Difference:  $d = -5$

$a_{52} = -219$

Explicit:  $a_n = 41 - 5n$

8)  $37, 41, 45, 49, \dots$

Common Difference:  $d = 4$

$a_{52} = 241$

Explicit:  $a_n = 33 + 4n$

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

9)  $-1, -3, -9, -27, \dots$

Common Ratio:  $r = 3$

$a_8 = -2187$

Explicit:  $a_n = -3^{n-1}$

10)  $2, -8, 32, -128, \dots$

Common Ratio:  $r = -4$

$a_8 = -32768$

Explicit:  $a_n = 2 \cdot (-4)^{n-1}$

**Find the missing term or terms in each arithmetic sequence.**

11)  $\dots, 33, \underline{\hspace{1cm}}, 21, \dots$   
 $27$

12)  $\dots, 16, \underline{\hspace{1cm}}, 12, \dots$   
 $14$

**Find the missing term or terms in each geometric sequence.**

13)  $\dots, -3, \underline{\hspace{1cm}}, -75, \dots$   
 $-15$

14)  $\dots, -4, \underline{\hspace{1cm}}, -100, \dots$   
 $-20$

Evaluate each series.

$$15) \sum_{k=1}^6 k(k-1)$$

70

$$16) \sum_{a=1}^6 a$$

21

Rewrite each series using sigma notation.

$$17) 5 + 25 + 125 + 625 + 3125 \quad \sum_{a=1}^5 5^a$$

$$18) 5 + 25 + 125 + 625 + 3125 + 15625 \quad \sum_{k=1}^6 5^k$$

Evaluate the related series of each sequence.

$$19) -4, -6, -8, -10$$

-28

$$20) 0, 4, 8, 12, 16$$

40

Evaluate each geometric series described.

$$21) -1 + 4 - 16 + 64 \dots, n = 6$$

819

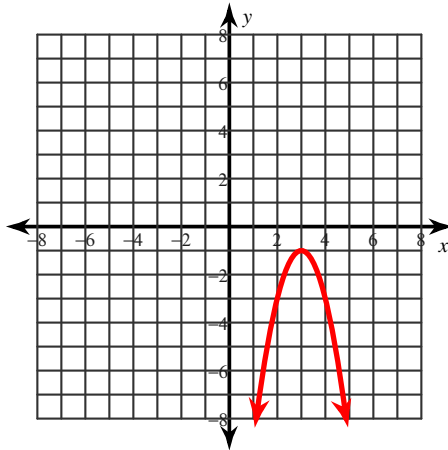
$$22) -1 + 6 - 36 + 216 \dots, n = 7$$

-39991

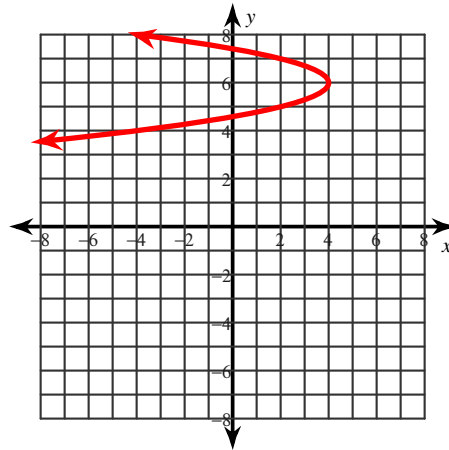
Classify each conic section, write its equation in standard form, and sketch its graph.

$$23) 2x^2 - 12x + y + 19 = 0$$

$$24) 2y^2 + x - 24y + 68 = 0$$



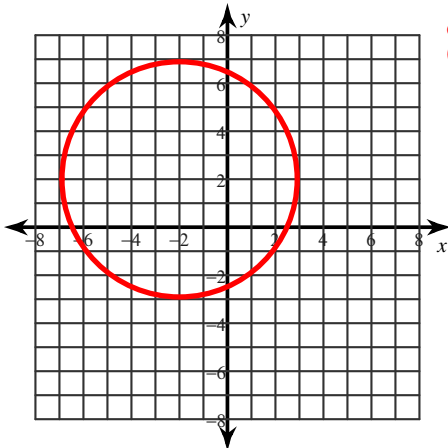
Parabola  
 $y = -2(x-3)^2 - 1$



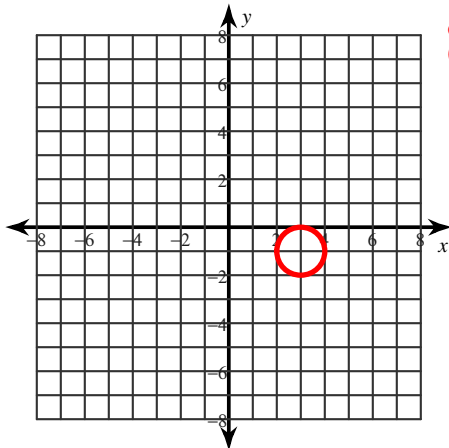
Parabola  
 $x = -2(y-6)^2 + 4$

$$25) x^2 + y^2 + 4x - 4y - 16 = 0$$

$$26) x^2 + y^2 - 6x + 2y + 9 = 0$$

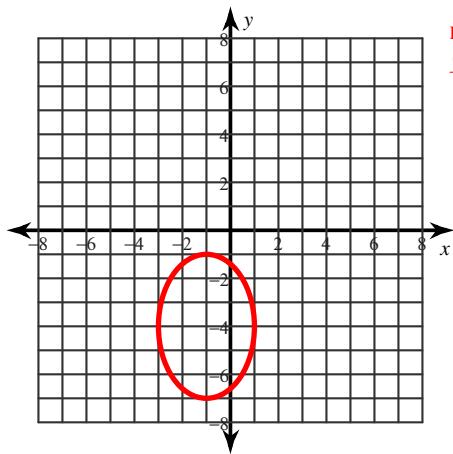


Circle  
 $(x+2)^2 + (y-2)^2 = 24$



Circle  
 $(x-3)^2 + (y+1)^2 = 1$

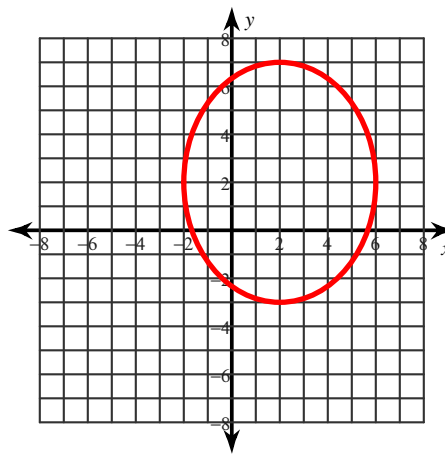
$$27) 9x^2 + 4y^2 + 18x + 32y + 37 = 0$$



Ellipse  

$$\frac{(x+1)^2}{4} + \frac{(y+4)^2}{9} = 1$$

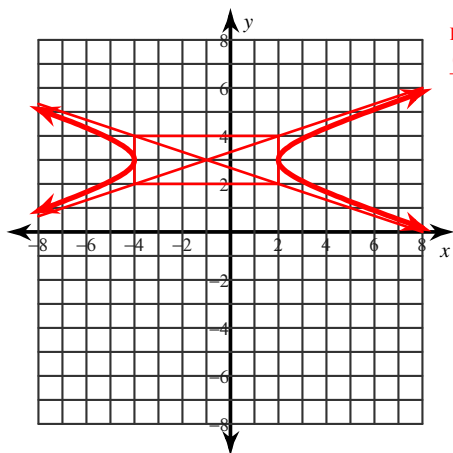
$$28) 25x^2 + 16y^2 - 100x - 64y - 236 = 0$$



Ellipse  

$$\frac{(x-2)^2}{16} + \frac{(y-2)^2}{25} = 1$$

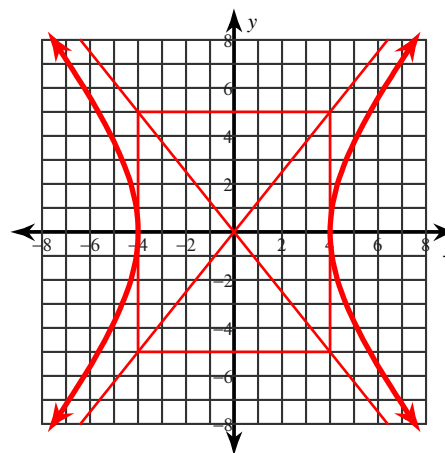
$$29) x^2 - 9y^2 + 2x + 54y - 89 = 0$$



Hyperbola  

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

$$30) 25x^2 - 16y^2 - 400 = 0$$



Hyperbola  

$$\frac{x^2}{16} - \frac{y^2}{25} = 1$$