

Chapter 9/15 Review

$$a_n = a_1 + (n - 1)d$$

$$a_n = a_1 r^{n-1}$$

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$S_n = a_1 \cdot \frac{1 - r^n}{1 - r}$$

Find the missing term or terms in each arithmetic sequence.

1) ..., -6, ____, ____, ____, -14, ...

2) ..., 36, ____, ____, ____, 436, ...

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

3) 7, -23, -53, -83, ...
Find a_{25}

4) 1, 101, 201, 301, ...
Find a_{23}

Find the formula for the n th term of an arithmetic sequence, then find the 17th term.

5) $a_1 = 12$ and $d = 3$

6) $a_4 = 48$ and $d = -6$

Find the n th term of an arithmetic sequence with

7) The first 3 terms are 19, 13, and 7.

8) $a_4 = 23$ and $a_9 = 58$

Find S_n for the arithmetic series in which

9) $a_1 = 6$, $a_n = 111$ and $n = 36$

10) $18 + 23 + 28 + \dots + 78$

Find the sum of the arithmetic series.

11) $\sum_{n=1}^{25} (3n + 5)$

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

12) 3, 18, 108, 648, ...

13) 4, -8, 16, -32, ...

Write an equation for the n th term of the geometric sequence

14) The first 3 terms are 12, $-3, \frac{3}{4}, \dots$. Then find the 6th term.

15) The first 3 terms are $\frac{1}{4}, 1, 4, \dots$. Then find the 11th term.

Given the second term and the common ratio of a geometric sequence find the nth term and then find the 8th term.

16) $a_2 = 20, r = -5$

17) $a_2 = 6, r = 3$

Given two terms in a geometric sequence find the common ratio, the nth term and then find the 8th term.

18) $a_6 = -243$ and $a_3 = -9$

19) $a_3 = -36$ and $a_2 = -6$

Find the sum of each geometric series described.

20) $\sum_{n=1}^9 2 \cdot 4^{n-1}$

21) $a_1 = 2, r = 5, n = 9$

22) $1 + \frac{2}{3} + \frac{4}{9} \dots, n = 5$

23) $4 + 16 + 64 + 256 \dots, n = 7$

Write each of the following in summation notation:

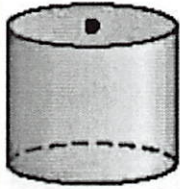
24) $-8 - 3 + 2 + \dots + 92$

25) $4 + 8 + 16 + 32 + \dots + 512$

Review:

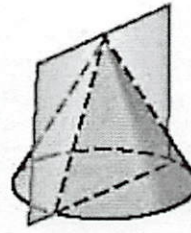
Representations of Three-Dimensional Figures

26. Describe the vertical and horizontal cross sections of the figure shown below.

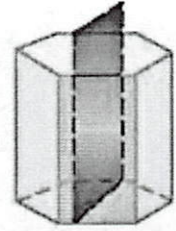


27. Describe each cross section

a)

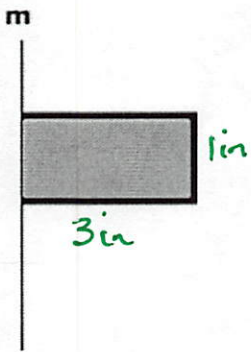


b)

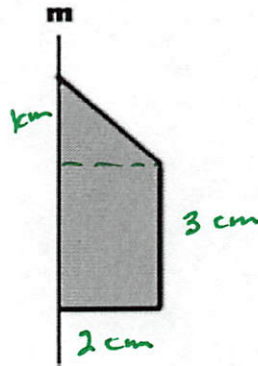


28. Describe the solid that is formed by rotating each of these figures about line m and sketch it.

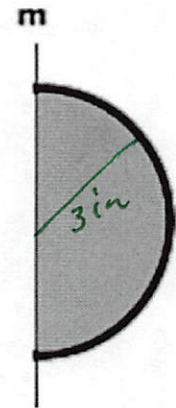
a)



b)



c)



Chapter 9/15 Review

$$a_n = a_1 + (n-1)d$$

$$S_n = \frac{n}{2}(a_1 + a_n)$$

$$a_n = a_1 r^{n-1}$$

$$S_n = a_1 \cdot \frac{1-r^n}{1-r}$$

Find the missing term or terms in each arithmetic sequence.

1) ..., -6, -8, -10, -12, -14, ...

$$d = -2$$

2) ..., 36, 136, 236, 336, 436, ...

$$d = 100$$

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

3) 7, -23, -53, -83, ...

Find a_{25}

$$a_1 = 7$$

$$d = -30$$

$$a_n = 7 + (n-1)(-30)$$

$$a_{25} = 7 + (25-1)(-30)$$

$$= -713$$

4) 1, 101, 201, 301, ...

Find a_{23}

$$a_1 = 1$$

$$d = 100$$

$$a_n = 1 + (n-1)(100)$$

$$a_{23} = 1 + (22)(100)$$

$$= 2201$$

Find the formula for the n th term of an arithmetic sequence, then find the 17th term.

5) $a_1 = 12$ and $d = 3$

$$a_n = 12 + (n-1)3$$

$$a_{17} = 12 + (16-1)3$$

$$= 60$$

6) $a_4 = 48$ and $d = -6$

$$a_n = a_1 + (n-1)(-6)$$

$$48 = a_1 + 3(-6)$$

$$a_1 = 66$$

$$a_n = 66 + (n-1)(-6)$$

$$a_7 = 66 + 16(-6) = -30$$

Find the n th term of an arithmetic sequence with

7) The first 3 terms are 19, 13, and 7.

$$a_1 = 19 \quad d = -6$$

$$a_n = 19 + (n-1)(-6)$$

8) $a_4 = 23$ and $a_9 = 58$

$$23 = a_1 + 3d$$

$$58 = a_1 + 8d$$

$$-23 = -a_1 - 3d$$

$$35 = 5d$$

$$d = 7$$

$$23 = a_1 + 21 \quad a_1 = 2$$

$$a_n = 2 + (n-1)7$$

Find S_n for the arithmetic series in which

9) $a_1 = 6$, $a_n = 111$ and $n = 36$

$$S_n = n \left(\frac{a_1 + a_n}{2} \right)$$

$$36 \left(\frac{6 + 111}{2} \right)$$

$$= \boxed{2106}$$

10) $18 + 23 + 28 + \dots + 78$

$$d = 5 \quad a_1 = 18$$

$$a_n = 78$$

$$a_n = a_1 + (n-1)d$$

$$78 = 18 + (n-1)5$$

$$60 = (n-1)5$$

$$12 = n-1 \quad n = 13$$

$$S_n = 13 \left(\frac{18 + 78}{2} \right)$$

$$= \boxed{624}$$

Find the sum of the arithmetic series.

11) $\sum_{m=1}^{25} (3m + 5)$

$$a_1 = 8$$

$$a_{25} = 80$$

$$S_n = n \left(\frac{a_1 + a_n}{2} \right)$$

$$= 25 \left(\frac{8 + 80}{2} \right)$$

$$= \boxed{1100}$$

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

12) 3, 18, 108, 648, ...

$$r = 6$$

$$a_n = 3(6)^{n-1}$$

$$a_8 = 3(6)^7 = \boxed{839,808}$$

13) 4, -8, 16, -32, ...

$$r = -2$$

$$a_n = 4(-2)^{n-1}$$

$$a_8 = 4(-2)^7 = \boxed{-512}$$

Write an equation for the n th term of the geometric sequence

14) The first 3 terms are 12, -3, $\frac{3}{4}$, ... Then find the 6th term.

$$r = -\frac{1}{4}$$

$$a_1 = 12$$

$$a_n = 12 \left(-\frac{1}{4} \right)^{n-1}$$

$$a_6 = 12 \left(-\frac{1}{4} \right)^5 = \boxed{-\frac{3}{256}}$$

15) The first 3 terms are $\frac{1}{4}$, 1, 4, ... Then find the 11th term.

$$r = 4$$

$$a_1 = \frac{1}{4}$$

$$a_n = \frac{1}{4} (4)^{n-1}$$

$$a_{11} = \frac{1}{4} (4)^{10} = \boxed{262,144}$$

Given the second term and the common ratio of a geometric sequence find the nth term and then find the 8th term.

16) $a_2 = 20, r = -5$

$$a_1 = \frac{20}{-5} = -4$$

$$a_n = -4(-5)^{n-1}$$

$$a_8 = -4(-5)^7 = 312,500$$

17) $a_2 = 6, r = 3$

$$a_1 = \frac{6}{3} = 2$$

$$a_n = 2(3)^{n-1}$$

$$a_8 = 2(3)^7 = 4374$$

Given two terms in a geometric sequence find the common ratio, the nth term and then find the 8th term.

18) $a_6 = -243$ and $a_3 = -9$

$$-243 = a_1 r^5$$

$$-9 = a_1 r^2$$

$$\frac{-243}{-9} = \frac{a_1 r^5}{a_1 r^2}$$

$$27 = r^3$$

$$3 = r$$

$$-9 = a_1 (3)^2$$

$$-1 = a_1$$

$$a_n = -1(3)^{n-1}$$

$$a_8 = -1(3)^7 = -2187$$

19) $a_3 = -36$ and $a_2 = -6$

$$-36 = a_1 r^2$$

$$-6 = a_1 r$$

$$\frac{-36}{-6} = \frac{a_1 r^2}{a_1 r}$$

$$6 = r$$

$$-6 = a_1 (6)$$

$$-1 = a_1$$

$$a_n = -1(6)^{n-1}$$

$$a_8 = -1(6)^7 = -279,936$$

Find the sum of each geometric series described.

20) $\sum_{n=1}^9 2 \cdot 4^{n-1}$

$$S_n = a_1 \left(\frac{1-r^n}{1-r} \right)$$

$$= 2 \left(\frac{1-4^9}{1-4} \right)$$

$$= 174,762$$

$a_1 = 2$
 $r = 4$
 $n = 9$

21) $a_1 = 2, r = 5, n = 9$

$$S_n = a_1 \left(\frac{1-r^n}{1-r} \right)$$

$$= 2 \left(\frac{1-5^9}{1-5} \right)$$

$$= 976,562$$

22) $1 + \frac{2}{3} + \frac{4}{9} \dots, n = 5$

$$r = \frac{2}{3}$$

$$1 \left(\frac{1 - (\frac{2}{3})^5}{1 - \frac{2}{3}} \right)$$

$$= \left(\frac{1 - \frac{32}{243}}{\frac{1}{3}} \right)$$

$$= 2 \frac{49}{81}$$

or $\frac{211}{81}$

23) $4 + 16 + 64 + 256 \dots, n = 7$

$$r = 4$$

$$4 \left(\frac{1-4^7}{1-4} \right) = 21,844$$

Write each of the following in summation notation:

24) $-8 - 3 + 2 + \dots + 92$

$$a_1 = -8$$

$$d = 5$$

$$a_n = -8 + (n-1)5$$

$$92 = -8 + (n-1)5$$

$$100 = (n-1)5$$

$$20 = n-1$$

$$21 = n$$

$$\sum_{n=1}^{21} -8 + (n-1)5$$

25) $4 + 8 + 16 + 32 + \dots + 512$

$$a_1 = 4$$

$$r = 2$$

$$a_n = 4(2)^{n-1}$$

$$512 = 4(2)^{n-1}$$

$$128 = 2^{n-1}$$

$$(2^x = 128)$$

$$x = 7$$

$$7 = n-1$$

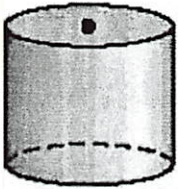
$$n = 8$$

$$\sum_{n=1}^8 4(2)^{n-1}$$

Review:

Representations of Three-Dimensional Figures

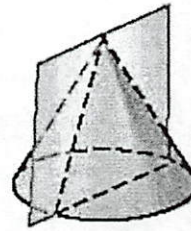
26. Describe the vertical and horizontal cross sections of the figure shown below.



Vertical: rectangle
horizontal: circle

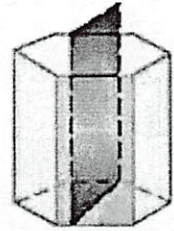
27. Describe each cross section

a)



Triangle

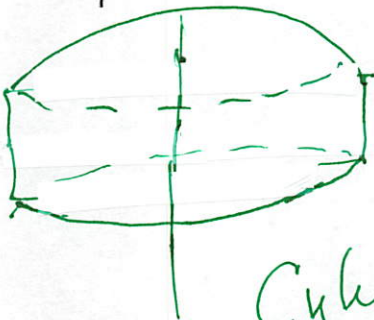
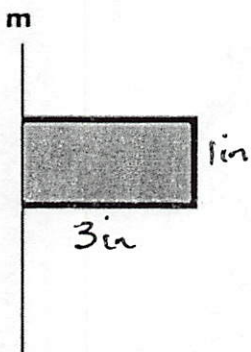
b)



rectangle

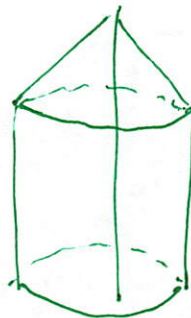
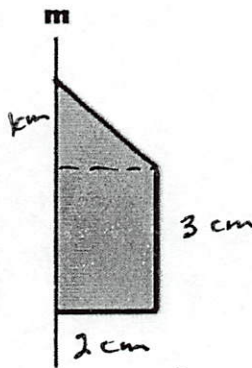
28. Describe the solid that is formed by rotating each of these figures about line m and sketch it.

a)



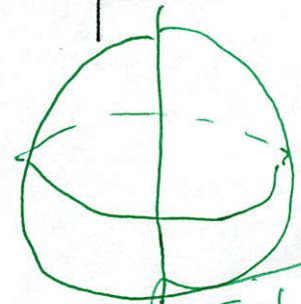
Cylinder
radius: 3 in
height: 1 in

b)



Cylinder with cone
radius of both 2 cm
height cone = 1 cm height cylinder = 3 cm.

c)



Sphere
radius = 3 in