# Chapter Test
Level A

Select the best answer.

1. What are the first 5 terms of the sequence where $a_1 = 2$ and $a_n = -2a_{n-1}$?

   A 2, 4, 8, 16, 32

   B 2, −4, 8, −16, 32

   C −2, 4, −8, 16, −32

   D −2, −4, −8, −16, −32

2. A company is tracking the number of complaints received on its website. During the first 4 months, they record the following numbers of complaints: 20, 25, 30, and 35. Which is a possible explicit rule for the number of complaints they will receive in the nth month?

   A $a_n = 20n + 5$ **B** $a_n = 15 + 5n$

3. Jeremiah puts $950 in a savings account earning 5% annually. If he doesn't withdraw or make any more deposits, approximately how much is his savings account worth after 3 years?

   A $965   **C** $1092

   B $995   **D** $1100

4. How many black triangles are in the next two iterations of the sequence shown below?

   a_1 a_2 a_3
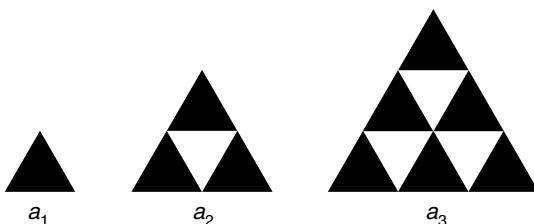
   A 4, 5   **C** 9, 12

   B 6, 9   **D** 10, 15

5. Which is summation notation for the series $2 + 4 + 8 + 16$?

   A $\sum_{k=1}^{4} 2k$ **B** $\sum_{k=1}^{4} 2^k$

6. Jervaise has a part-time job delivering newspapers. The first day, his route took 100 minutes to complete. As he gets better at his job, each day takes 10% less than the day before. How many minutes, total, does Jervaise work during the first 3 days?

   A 81   **C** 270

   B 90   **D** 271

7. Evaluate $\sum_{k=1}^{11} 4$.

   A 4   **C** 40

   B 11   **D** 44

8. Brittany has a 25 page report to write for her English class. If every day she writes 20% of the pages that remain unwritten, how many pages will she write in 2 days?

   A 5   **C** 9

   B 8   **D** 10

9. Evaluate $\sum_{k=1}^{4} (2)^{k-1}$.

   A 8   **C** 16

   B 15   **D** 30

10. Kieran is practicing for a talent show. He practices 30 minutes the first day and adds 10 minutes each day thereafter. How many minutes does Kieran practice, total, over 4 days?

    A 150   **B** 180

11. Valentine increases the number of books she reads by the same amount each month. If she reads 4 books in the second month and 8 books in the sixth month, how many books does she read in the third month?

    A 5   **C** 7

    B 6   **D** 8

Holt Algebra 2

CHAPTER
12

Chapter Test
Level A continued

12. What is the common difference of the sequence 3, 4.5, 6, 7.5, …?

A 1.5　　　　　　**C** 3

B 2　　　　　　　**D** 4.5

13. What is S_6 for the arithmetic series $4 + 4.2 + 4.4 + 4.6 + 4.8 + …$?

A 5　　　　　　　**B** 27

14. A new restaurant has only 20 customers during their first week open. If they increase the number of customers by 15% each week, approximately how many customers will they have during the eighth week?

A 44　　　　　　**C** 140

B 61　　　　　　**D** 280

15. What is the geometric mean of 4 and 16?

A ±8　　　　　　**B** ±10

16. What is the common ratio of the geometric sequence $3, \dfrac{3}{2}, \dfrac{3}{4}, \dfrac{3}{8}, ….$

A $\dfrac{1}{3}$　　　　　**C** $\dfrac{3}{2}$

B $\dfrac{1}{2}$　　　　　**D** 2

17. Marsha saves $92 during her first month at a new job. If she increases the amount she saves by 20% each month, how much will she have saved after 3 months?

A $312.80　　　　**B** $334.88

18. What is the sum of the geometric series $\displaystyle\sum_{m=1}^{3} 2(3)^{m-1}$?

A 15　　　　　　**C** 26

B 18　　　　　　**D** 27

19. A scouting troop eats 64 hot dogs on the first night of their camping trip. As they get tired of eating hot dogs, they eat only half as many as the night before. If the trip last 6 days, how many hot dogs do they eat in all?

A 126　　　　　　**B** 224

20. Which of the following series diverges?

A $10 + 5 + 2.5 + 1.25 + …$

B $100 + 90 + 81 + 72.9 + …$

C $100 + 50 + 25 + 12.5 + …$

D $10 + 15 + 22.5 + 33.75 + …$

21. A clerk is stacking boxes for a display in his store. If he follows the pattern below, how many boxes will he use to complete the display?
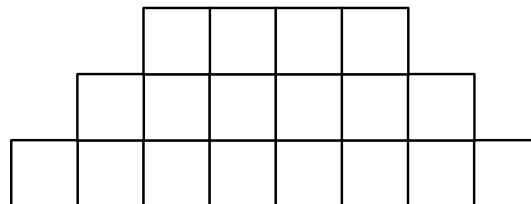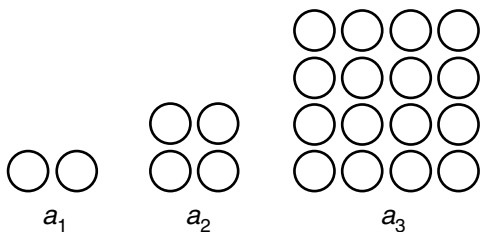

A 6　　　　　　　**C** 20

B 18　　　　　　**D** 24

22. Evaluate $\displaystyle\sum_{q=1}^{\infty} \left(\dfrac{1}{2}\right)^{q}$.

A 1　　　　　　　**B** 2

23. Which is a counterexample that disproves $3n < 3^n$?

A $n = -1$　　　　**C** $n = 1$

B $n = 0$　　　　　**D** $n = 2$

24. An infinite geometric series has a sum of 10 and a common ratio of 0.5. What is the first term of the series?

A 1　　　　　　　**C** 10

B 5　　　　　　　**D** 20

Holt Algebra 2

Name _____ Date _____ Class _____

Chapter Test
Level B

Select the best answer.

1. What are the first 5 terms of the sequence where $a_1 = -6$ and $a_n = 2 - 2a_{n-1}$?
   A $-6, -4, -2, 0, 2$
   B $-6, 8, -6, 8, -6, 8$
   C $-6, 14, -26, 54, -106$
   D $-6, -10, -18, -34, -66$

2. A city is tracking reports of identity theft. During the first 4 weeks of their study, they find the following number of reports: 11, 22, 44, and 88. Which is a possible explicit rule for the number of reports in the nth week?
   F $a_n = 11(2)^n$
   G $a_n = 2(11)^n$
   H $a_n = 11(2)^{n-1}$
   J $a_n = 2(11)^{n-1}$

3. Wayne buys a motorcycle for $8000. Each year, the cycle loses 20% of its re-sale value from the previous year. How much is the motorcycle worth after 3 years?
   A $2200
   B $3904
   C $4096
   D $6400

4. How many dots are in the next two iterations of the sequence shown below?

   a_1 a_2 a_3

   F 25, 36
   G 32, 64
   H 256, 512
   J 256, 65, 536

5. Which is summation notation for the series $4 + 6 + 9 + 13.5$?
   A $\sum_{k=1}^{4} 1.5(k)^4$
   B $\sum_{k=1}^{4} 4(1.5)^{k-1}$
   C $\sum_{k=1}^{4} 1.5(4)^{k-1}$
   D $\sum_{k=1}^{4} k(1.5)^4$

6. Jin-Woo is making a series of sculptures. Each one takes 5 days longer to complete than the one before it. The first sculpture takes 27 days. How many days does it take Jin-Woo to complete the first four sculptures?
   F 47
   G 96
   H 135
   J 138

7. Evaluate $\sum_{k=1}^{13} k$.
   A 13
   B 91
   C 169
   D 819

8. Jim owes his brother $100. He has agreed to pay 20% of the remaining balance each month. How much will Jim pay towards his debt in the first 3 months?
   F $48.80
   G $51.20
   H $58.80
   J $60.00

9. Evaluate $\sum_{k=3}^{6} (-1)^{k-1}$.
   A -1
   B 0
   C 1
   D 2

10. Maurice's landlord raises his rent by the same amount each year. During his second year in his apartment, he paid $530 each month. During his sixth year he paid $590 each month. How much did Maurice pay during his first year in the apartment?
    F $500
    G $505
    H $515
    J $525

11. Novinha sells 6 boxes of daisies at the first day of a flower show. If every day she sells 8 more than the day before and the show lasts for two weeks, how many boxes of daisies does she sell in all?
    A 48
    B 110
    C 702
    D 812

Holt Algebra 2

CHAPTER

Chapter Test

12 *Level B* continued

12. What is the common difference of the sequence 8, 12, 16, 20, …?

F 1.5   **H** 4

G 2.5   **J** 8

13. What is S_{31} for the arithmetic series $9 + 8.5 + 8 + 7.5 + 7 + …$?

A −6   **C** 46.5

B 38.75   **D** 511.5

14. A population of sea monkeys starts out numbering 86. Their numbers increase by 10% each month. If no sea monkeys die, what is the approximate total population after one year?

F 189   **H** 1135

G 270   **J** 1323

15. What is the geometric mean of −4 and −16?

A ±8   **C** ±20

B ±10   **D** ±64

16. What is the common ratio of the geometric sequence $\frac{3}{4}, \frac{3}{2}, 3, 6, …$.

F $\frac{1}{3}$ **H** 2

G $\frac{1}{2}$ **J** 3

17. Tella volunteers 10 hours at a local shelter during one month. If she increases her hours by 10% each month, approximately how many hours total will she volunteer in 7 months?

A 70   **C** 88

B 77   **D** 95

18. What is the approximate sum of the geometric series $\sum_{m=1}^{8} 3(0.9)^{m-1}$?

F 15.7   **H** 21.6

G 17.12   **J** 27.0

19. Chiqua hikes for 6 hours during the first day of a 4 day camping trip. Each day, she hikes 70% as long as the day before. How many hours does she hike in all?

A 13   **C** 17

B 15   **D** 20

20. Which of the following series converges?

F $\frac{1}{2} + \frac{3}{2} + \frac{9}{2} + \frac{27}{2} + …$

G $-40 - 20 - 10 - 5 - …$

H $10 + 15 + 22.5 + 33.75 + …$

J $100 - 110 + 121 - 133.1 + …$

21. A printer is making a design for a client of nested squares. Each square is drawn inside another square as shown.


8 in.

4 in.

2 in.
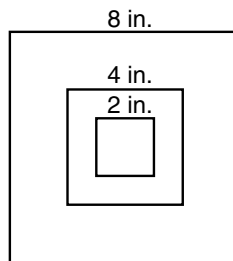
If he continues this pattern, what is the total perimeter of all the squares?

A 16 in.   **C** 64 in.

B 32 in.   **D** 80 in.

22. Evaluate $\sum_{q=1}^{\infty} \frac{6}{3^{q-1}}$.

F 6   **H** 12

G 9   **J** 18

23. Which is a counterexample that disproves $4n < 4^n$?

A $n = -1$ **C** $n = 1$

B $n = 0$ **D** $n = 2$

24. An infinite geometric series has a sum of 200 and a common ratio of 0.4. What is the first term of the series?

F 80   **H** 333

G 120   **J** 500

Holt Algebra 2

Name _____ Date _____ Class _____

Chapter Test
Level C

Select the best answer.

1. What are the first 5 terms of the sequence where $a_1 = 0$ and $a_n = 1 - 4a_{n-1}$?

A 0, −1, 3, −13, 51

B 0, 1, −3, 13, −51

C 0, −3, 13, −51, 203

D 0, 3, −13, 51, −203

2. A company is tracking the number of hours of overtime paid each week. In the first 4 weeks, they find the following numbers of overtime hours: 20, 30, 45, and 67.5. Which is a possible explicit rule for overtime hours in the nth week?

F $a_n = 20(1.5)^n$ **H** $a_n = 20(1.5)^{n-1}$

G $a_n = 1.5(20)^n$ **J** $a_n = 1.5(20)^{n-1}$

3. Jim has a comic book collection worth $450. Each year, the collection increases in value by 5.5%. Approximately how much is the collection worth after 10 years?

A $505.00   **C** $768.67

B $697.50   **D** $1000.00

4. How many squares are in the next two iterations of the sequence shown below?

a_1 a_2 a_3
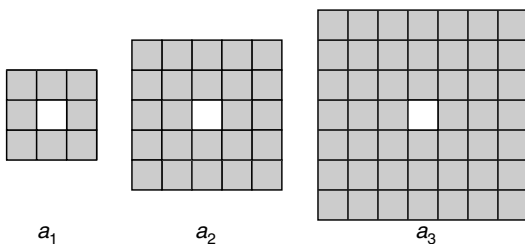
F 72, 96   **H** 80, 120

G 75, 100   **J** 96, 192

5. Which is summation notation for the series $0.3 - 0.9 + 2.7 - 8.1$?

A $\sum_{k=1}^{4} -0.3(3)^{k-1}$ **C** $\sum_{k=1}^{4} 3(-0.3)^{k-1}$

B $\sum_{k=1}^{4} 0.3(-3)^{k-1}$ **D** $\sum_{k=1}^{4} -3(0.3)^{k-1}$

6. A cooper can repair 14 barrels in one day. If he increases his output by 2.5 barrels each day, how many can he repair in one week?

F 113.0   **H** 150.5

G 115.5   **J** 220.5

7. Evaluate $\sum_{k=6}^{15} k^2$.

A 1145   **C** 1200

B 1185   **D** 1240

8. Sirrel is standing at the base of a 6300-ft tall mountain. If she climbs 15% of the remaining height each day, how many feet will she climb in 4 days?

F 2835.0   **H** 3288.6

G 3011.4   **J** 3465.0

9. Evaluate $\sum_{k=0}^{5} (-2)^{k-1}$.

A −21   **C** 10.5

B −10.5   **D** 21

10. A television show is losing viewers at a constant rate due to a change in writers. During January, 14.2 million people watched the show. During April, 11.65 million people watched. How many people watched the show in September?

F 7.4 million   **H** 9.1 million

G 8.3 million   **J** 9.6 million

11. Reginald makes $40.50 in tips at his job on Monday. If he makes $3.50 more each day and works all week, how much, total, will he make in tips by Friday?

A $216.50   **C** $234.00

B $220.00   **D** $237.50

Holt Algebra 2

CHAPTER
12

Chapter Test
Level C continued

12. What is the common difference of the sequence $-18, -3, 12, \ldots$?

F -21 **H** 15

G -15 **J** 21

13. What is S_{40} for the arithmetic series $1 - 2 - 5 - 8 - 11 - \ldots$?

A -2380 **C** -2320

B -2340 **D** -2300

14. A biologist is studying the presence of a trait in a population of flies. She sees the trait in 543 of the flies at first, but it increases at a rate of 13% each day. Approximately how many flies have this trait after 10 days?

F 1227 **H** 1841

G 1248 **J** 1843

15. What is the geometric mean of -1.5 and -80 ?

A $\pm 2\sqrt{30}$ **C** ± 40.75

B $\pm 12\sqrt{10}$ **D** ± 120

16. What is the common ratio of the geometric sequence $\frac{3}{4}, \frac{15}{12}, \frac{75}{36}, \ldots$?

F $\frac{1}{3}$ **H** $\frac{3}{5}$

G $\frac{4}{3}$ **J** $\frac{5}{3}$

17. Jillene spends $240 on a new business the first month. If she spends 24% more each month, approximately how much will she spend, total, in 6 months?

A $1785.60   **C** $2635.22

B $1931.62   **D** $3507.67

18. What is the approximate sum of the geometric series $\displaystyle\sum_{m=1}^{11} 21(0.99)^{m-1}$?

F 144.1 **H** 200.8

G 199.8 **J** 219.8

19. In a week of training, Amana runs for 200 minutes the first day and decreases the amount of time by 30% each day. How many minutes, total, does she run?

A 285.7 **C** 666.7

B 381.0 **D** 833.3

20. Which of the following series diverges?

F $4 - 3.6 + 3.24 - 2.916 + \ldots$

G $0.8 - 0.64 - 0.512 - 0.4096 - \ldots$

H $0.8 - 0.88 + 0.968 - 1.0648 + \ldots$

J $100 + 99 + 98.01 + 97.0299 + \ldots$

21. Each circle has a radius half as large as the next largest circle. This pattern is to be continued ad infinitum.
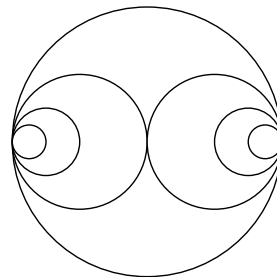
If the radius of the outer circle is 2 inches, which is the sum of the circumferences of all the circles once the pattern is complete?

A 4π in.   **C** 12π in.

B 8π in.   **D** 16π in.

22. Evaluate $\displaystyle\sum_{q=1}^{\infty} \frac{9}{9^{q-1}}$.

F 1.125 **H** 10.125

G 8.000 **J** 20.000

23. Which is a counterexample that disproves $4(n-1) < 4^{n-1}$?

A $n = -1$ **C** $n = 1$

B $n = 0$ **D** $n = 2$

24. An infinite geometric series has a sum of 12 and a common ratio of 0.25. What is the first term of the series?

F 3 **H** 8

G 6 **J** 9

Holt Algebra 2

Name _____ Date _____ Class _____

Select the best answer.

1. What are the first 5 terms of the sequence where $a_1 = 3$ and $a_n = 2a_{n-1}$?

_____

_____

2. For a science experiment, Abdullah measures a bean stalk as it grows. In the first 4 weeks, he measures the stalk as 3, 6, 9, and 12 centimeters. Write an explicit rule for the height of the bean stalk in centimeters after n weeks.

_____

3. A lake is 75 meters wide at the beginning of the summer. It shrinks by 10% each week due to a drought. How wide is the lake after 6 weeks? Round your answer to the nearest hundredth of a meter.

_____

4. How many dots will appear in the next two iterations of the sequence shown below?

a_1 $\qquad$ a_2 $\qquad$ a_3

_____
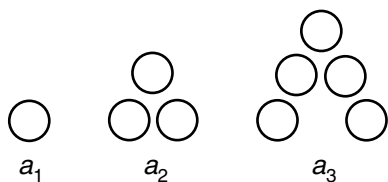
5. Write the following series in summation notation.

$12 + 6 + 3 + 1.5 + 0.75$

_____

6. Amy has a job in sales and travels to meet with clients. The first week on the job, she drove 500 miles. She had to add 45 miles to her travel each week. How far did she drive in her first 5 weeks on the job?

_____

7. Evaluate $\sum\limits_{k=1}^{14} 7.5$.

_____

8. Tom is painting a fence, but he's taking his time. There are 100 feet of fence to paint, but he only paints 50% of the unpainted fence each day. How many feet has he painted after 4 days?

_____

9. Evaluate $\sum\limits_{k=1}^{5} (-3)^{k-1}$.

_____

10. A student begins to study more and as a result her grade increases by the same amount each month. Her grade the first month was a 70 and her grade was a 79 in month 4. What is her grade in month 6?

_____

11. The cost of heating the Charpentier's house in October is $250. As winter progresses, the price increases $30 each month. How much does the family pay to heat their home for 5 months (October to February)?

_____

Holt Algebra 2

Name _____ Date _____ Class _____

12. Find the common difference of the sequence 9, 21, 33, 45, ….

_____

13. Find S_9 for the arithmetic series $2 + 5 + 8 + 11 + 14 + \ldots$.

_____

14. An athlete is training for an event. When he begins he can lift 60 pounds. He increases the amount by 15% each week for 6 weeks. How much does he lift in the last week? Round your answer to the nearest pound.

_____

15. Find the geometric mean of 3 and 12.

_____

**16.** Find the common ratio of the geometric sequence 243, 81, 27, 9, ….

_____

17. The first day of a fundraiser results in $100 of pledges. If the fundraiser earns 20% more each day, how much does the fundraiser earn, total, after 4 days?

_____

18. Find the sum of the geometric series $\sum_{m=1}^{5} 8(0.25)^{m-1}$. Round your answer to the hundredths place.

_____

19. A hotel decides to charge $100 for the first night, but only 75% of the previous night's cost for each additional night. How much does it cost to stay at the hotel for 4 nights?

_____

20. Determine whether the geometric series converges or diverges:

$0.4 + 0.6 - 0.9 + 1.35 - \ldots$

_____

21. Patrice is making a pyramid out of sugar cubes. The bottom three rows are shown below.
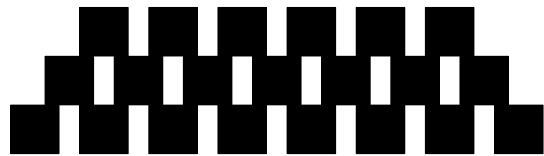
If this pattern continues, how many sugar cubes will Patrice use to make her pyramid?

_____

22. Evaluate $\sum_{q=1}^{\infty} \dfrac{1}{2^{q-1}}$.

_____

23. Find a counterexample that disproves $2^n < 2n$.

_____

24. An infinite geometric series has a sum of 100 and a common ratio of $\dfrac{4}{5}$. What is the first term of the series?

_____

Holt Algebra 2

Name _____ Date _____ Class _____

Chapter Test
Level B

Select the best answer.

1. What are the first 5 terms of the sequence where $a_1 = 4$ and $a_n = 10 - 3a_{n-1}$?

_____

2. Stacey goes fishing every Saturday morning. On the first 4 Saturdays of fishing season, she catches the following number of fish: 2, 4, 8, and 16. Write a possible explicit rule for the number of fish caught in the nth week.

_____

3. A barn starts out with 120 mice. The population decreases by 27% each year after the farmers buy a cat. How many mice are left after 4 years?

_____

4. How many dots will appear in the next two iterations of the sequence shown below?

a_1 a_2 a_3

_____
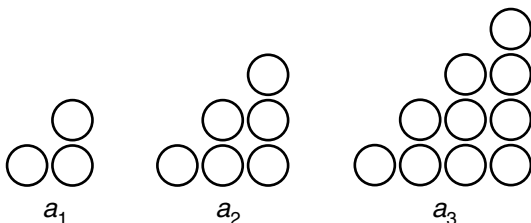
5. Write the following series in summation notation.

$68 + 102 + 153 + 229.5$

_____

6. Jessica filled her car up with gas 5 times in the last two months. The first time, it cost her $19. Because the price of gas was increasing, it cost her $1.50 more each time she filled up. How much did she spend in gas over the last two months?

_____

7. Evaluate $\sum_{k=1}^{20} k$.

_____

8. A new state law requires a certain company to clean up 300 acres of its land. The company agrees to work on 40% of the remaining land each year. How many acres have they cleaned up after 4 years?

_____

9. Evaluate $\sum_{k=2}^{5} (-2)^{k-1}$.

_____

10. Yasin's father increases his allowance each year on his birthday. His allowance was $5 a week when he was 8 and $12.50 a week when he was 11. What is Yasin's weekly allowance when he is 14?

_____

11. Barry reads 2 pages of a book the first night. He reads 3.5 pages the second night. If he continues to read 1.5 pages more than the previous night, how many pages will he have read after 7 days?

_____

Holt Algebra 2

Name _____ Date _____ Class _____

12. Find the common difference of the sequence $-2, -1.5, -1, -0.5, \ldots$.

_____

13. Find S_{11} for the arithmetic series $3 + 5.5 + 8 + 10.5 + 13 + \ldots$.

_____

14. An investor has purchased $5055 of a stock that increases in price by 12% each year. How much can she sell the stock for after 5 years?

_____

15. Find the geometric mean of 10 and 90.

_____

16. Find the common ratio of the geometric sequence $\frac{4}{3}, \frac{8}{3}, \frac{16}{3}, \frac{32}{3}, \ldots$.

_____

17. A telemarketer makes 12 calls during his first hour at work. If he increases his output by 13% each hour, how many calls will he make during his 8-hour work day?

_____

18. Find the sum of the geometric series $\sum\limits_{m=1}^{7} 8(0.3)^{m-1}$. Round your answer to the hundredths place.

_____

19. Rosalie sleeps 8 hours the first night. Each night she stays up later and only sleeps 75% as much as each previous night. How many hours does she sleep, total, in 4 days?

_____

20. Determine whether the geometric series converges or diverges:

$$-4 + \frac{16}{3} - \frac{64}{9} + \frac{256}{27} - \ldots$$

_____

21. The triangles below are all equilateral and each smaller triangle has a side length half that of the next larger.
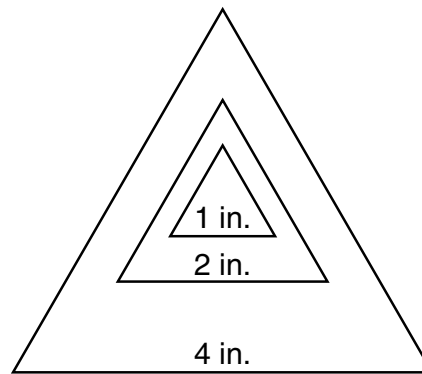
If this pattern continues, what is the total perimeter of all the triangles?

_____

22. Evaluate $\sum\limits_{q=1}^{\infty} \dfrac{5}{3^{q-1}}$.

_____

23. Find a counterexample that disproves $\frac{1}{2}n < 1^n$.

_____

24. An infinite geometric series has a sum of 120 and a common ratio of $\frac{2}{3}$. What is the first term of the series?

_____

Holt Algebra 2

Name _____ Date _____ Class _____

Chapter Test
Level C

Select the best answer.

1. What are the first 5 terms of the sequence where $a_1 = 0$ and $a_n = 3.5 - 3a_{n-1}$?

_____

2. Mandy is adding ice cubes to her soup to cool it down. For the first 3 minutes after the soup is served, the temperature, in degrees Fahrenheit, is 150, 146.5, 143. Write a possible explicit rule for the temperature in the nth minute.

_____

3. A small town with a population of 1234 lowers its taxes and families start to move there from the city. If the population increases by 5% each year, what is the total population after 13 years?

_____

4. How many squares will appear in each of a_4 and a_5?

a_1 a_2 a_3

_____
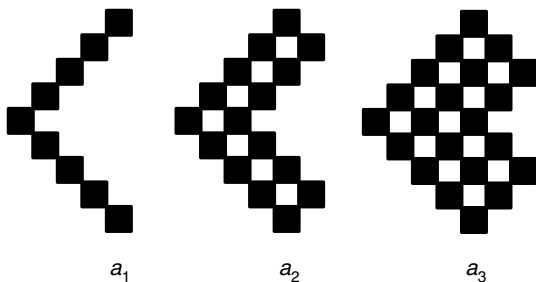
5. Write the following series in summation notation.

$$45 + 5 + \frac{1}{9}$$

_____

6. During the first hour of a snowstorm, snow accumulated at a rate of 0.25 inches per hour. The rate increased by 0.15 inches per hour after each hour of the storm. How much snow had fallen after 7 hours?

_____

7. Evaluate $\displaystyle\sum_{k=3}^{11} k^2$.

_____

8. If he did it all at once, it would take Antoine 140 minutes to clean his room. Instead, he cleans 45% of the dirty part each day for 4 days. Assuming the rate of cleaning is the same, how long has he spent cleaning his room? Round your answer to the nearest minute.

_____

9. Evaluate $\displaystyle\sum_{k=3}^{8} (-2.5)^{k-1}$. Round your answer to the nearest hundredth.

_____

10. Kevlin's bedtime increases by the same amount each year on his birthday. When he was 8, his bedtime was 7:35. When he was 12, his bedtime was 8:55. What was his bedtime when he was 11 years old?

_____

11. A student studies for 30 minutes one night and 42 minutes the next. If she continues to study 12 minutes longer each night, how long will she have studied after one week?

_____

Holt Algebra 2

CHAPTER
12

Chapter Test

Level C continued

12. Find the common difference of the sequence $-1.44, -0.62, 0.2, 1.02, \ldots$.

_____

13. Find S_{101} for the arithmetic series $3 + 1.5 + 0 + -1.5 + -3 + \ldots$.

_____

14. The price of a certain type of silk starts at \$19.50 per yard. If it increases by 5% each week for 8 weeks, how much will one yard of this silk cost at the end of 8 weeks?

_____

15. Find the geometric mean of 2 and 190. Simplify your answer.

_____

**16.** Find the common ratio of the geometric sequence $5, 4, \frac{16}{5}, \ldots$.

_____

17. Mariko weeds 60 square feet of her garden the first day, and decreases the amount of work by $\frac{2}{3}$ each day after. How much of her garden has she weeded after 4 days? Round your answer to the nearest square foot.

_____

18. Find the sum of the geometric series $\sum\limits_{m=2}^{10} -3(0.25)^{m-1}$. Round your answer to the hundredths place.

_____

19. Sara works 4 hours one day and then works only 80% as much each following day. How many hours, total, does she work after 6 days? Round your answer to the nearest hundredth hour.

_____

20. Determine whether the geometric series converges or diverges:

$-0.25 - 0.275 - 0.3025 - 0.33275 - \ldots$

_____

21. The right triangle below has smaller and smaller triangles drawn within it as shown. *The drawing is not to scale.*
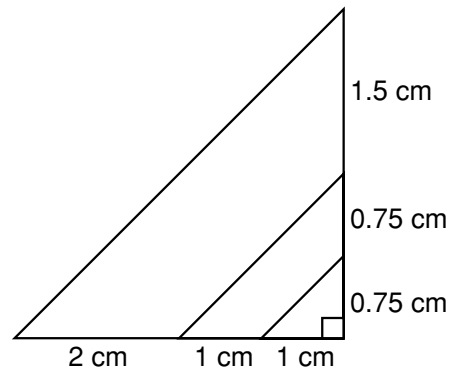
If this pattern continues, what is the total length of all the lines in the figure?

_____

22. Evaluate $\sum\limits_{q=2}^{\infty} \frac{2}{5^{q-1}}$.

_____

23. Find a counterexample that disproves $4^n \geq \frac{4}{n}$.

_____

24. An infinite geometric series has a sum of 31.25 and a common ratio of $\frac{1}{5}$. What is the first term of the series?

_____

Holt Algebra 2

Answer Key continued

6. J

7. B

8. H

9. A

10. H

11. D

12. G

Section Quiz: Lessons 12-4 to 12-5

1. C

2. H

3. B

4. F

5. C

6. G

7. A

8. G

9. A

10. H

11. A

12. F

Chapter Test Form A

1. B

2. B

3. D

4. D

5. B

6. D

7. D

8. C

9. B

10. B

11. A

12. A

13. B

14. B

15. A

16. B

17. B

18. C

19. A

20. D

21. C

22. A

23. C

24. B

Chapter Test Form B

1. C

2. H

3. C

4. J

5. B

6. J

7. B

8. F

9. B

10. H

11. D

12. H

13. C

14. G

15. A

16. H

17. D

18. G

19. B

20. G

Holt Algebra 2

Answer Key continued

<div style="display: flex;">
<div>

21. C

22. G

23. C

24. G

Chapter Test Form C

1. B

2. H

3. C

4. H

5. B

6. H

7. B

8. G

9. C

10. F

11. D

12. H

13. D

14. J

15. A

16. J

17. C

18. J

19. C

20. H

21. C

22. H

23. D

24. J

Chapter Test Form A

1. 3, 6, 12, 24, 48

2. $a_n = 3n$

</div>
<div>

3. 39.86 meters

4. a_4: 7 dots; a_5: 9 dots

5. $\sum_{k=1}^{5} 12(0.5)^{k-1}$

6. 2950 miles

7. 105

8. 93.75 feet

9. 61

10. 85

11. $1550

12. 12

13. 126

14. 139 pounds

15. ± 6

16. $\frac{1}{3}$

17. $536.80

18. 10.66

19. $273.44

20. diverges

21. 36

22. 2

23. any $n \leq 1$

24. 20

Chapter Test Form B

1. 4, −2, 16, −38, 124

2. $a_n = 2^n$

3. 34

4. a_4: 15; a_5: 21

5. $\sum_{k=1}^{4} 68(1.5)^{k-1}$

6. $110

7. 210

8. 261.12

</div>
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Holt Algebra 2

Answer Key continued

9. 10

10. $20

11. 45.5

12. 0.5

13. 170.5

14. $8908.64

15. ± 30

16. 2

17. 153

18. 11.43

19. 21.875

20. diverges

21. 24

22. 7.5

23. any $n \geq 2$

24. 40

Chapter Test Form C

1. 0, 3.5, -7, 24.5, -70

2. $a_n = 150 - (3.5)(n - 1)$

3. 2326

4. a_4: 24 squares; a_5: 25 squares

5. $\sum_{k=1}^{3} 45\left(\dfrac{1}{9}\right)^{k-1}$

6. 4.9 inches

7. 501

8. 127 minutes

9. -434.18

10. 8:35

11. 462

12. 0.82

13. -7272

14. $28.81

15. $\pm 2\sqrt{95}$

16. $\dfrac{4}{5}$

17. 89 square feet

18. -1

19. 14.76 hours

20. diverges

21. 17 cm

22. $\dfrac{1}{2}$

23. $0 < n < 1$

24. 25

Performance Assessment

1. $400,000; $320,000; $256,000; $204,800

2. geometric sequence

3. $a_n = a_{n-1} \cdot (0.8)$ or
$a_n = 400{,}000 \cdot (0.8)^{n-1}$

4. $1,180,800

5. geometric series

6. $S = \dfrac{a_1}{1 - r} = \dfrac{\$400{,}000}{1 - 0.8} = \$2{,}000{,}000$

7. $\dfrac{\$2{,}000{,}000}{\$400{,}000} = 5$

8. The economic multiplier is $\dfrac{1}{1 - r}$;

e.m. $= \dfrac{S}{a_1} = \dfrac{\frac{a_1}{1-r}}{a_1} = \dfrac{\cancel{a_1}}{1-r} \cdot \dfrac{1}{\cancel{a_1}} = \dfrac{1}{1-r}$.

9. $\dfrac{1}{1 - 0.5} = 2$

10. $4 = \dfrac{1}{1 - r}$; $r = 0.75 = 75\%$

Cumulative Test

1. B

2. H

3. A

4. G

5. B

6. F

7. D

Holt Algebra 2