

NAME: .....

Grade: 8

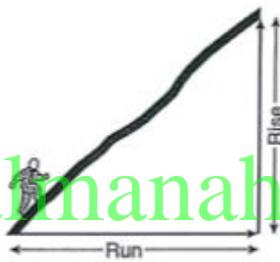
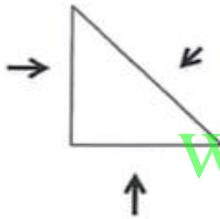
DATE: .....

Instructions:

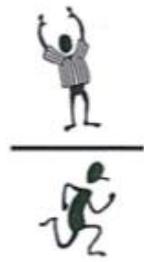
- ❖ Read the questions carefully
- ❖ Answer all the questions on the paper
- ❖ Work neatly
- ❖ Believe in yourself

**Hints: (SLOPE)**

Parts of a triangle



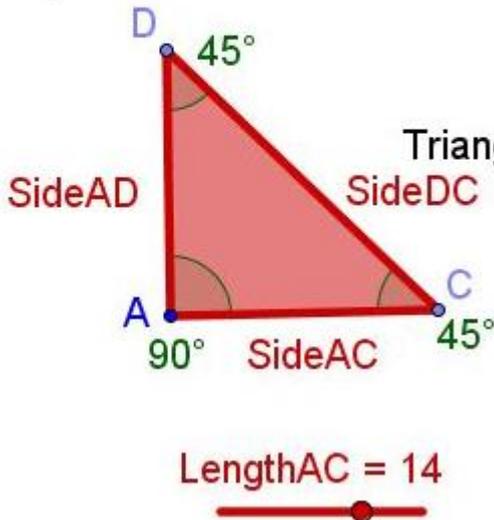
$$\text{Slope} = \frac{\text{rise}}{\text{run}} = \frac{\text{Change in } y}{\text{Change in } x}$$



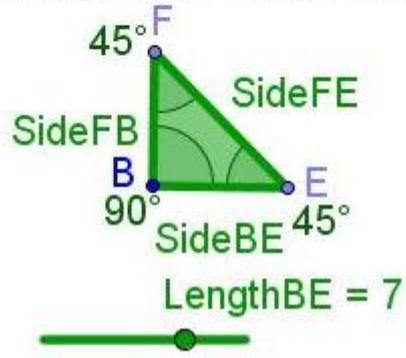
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**(TRIANGLES)**

$$\text{Triangle A Perimeter} = 14 + 14 + 19.8 = 47.8$$



$$\text{Triangle B Perimeter} = 7 + 7 + 9.9 = 23.9$$

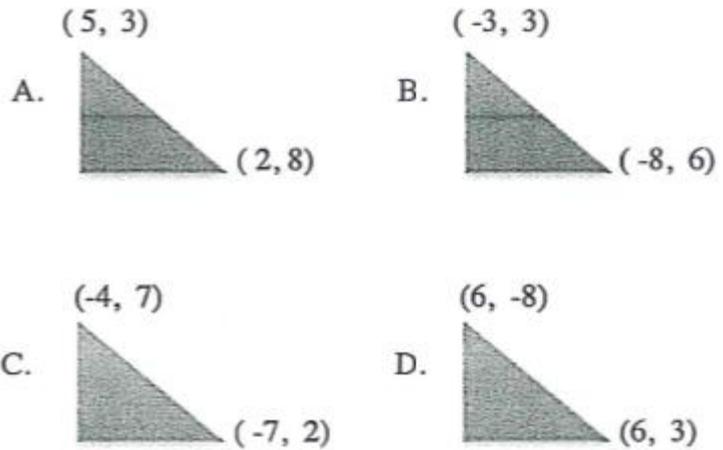
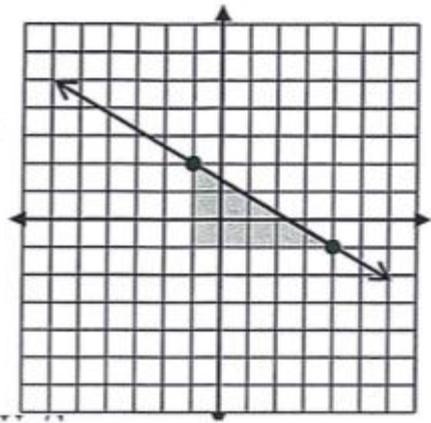


$$\text{Ratio of Perimeter of Triangle A to Triangle B} = 2$$

**Section A**

Question 1:

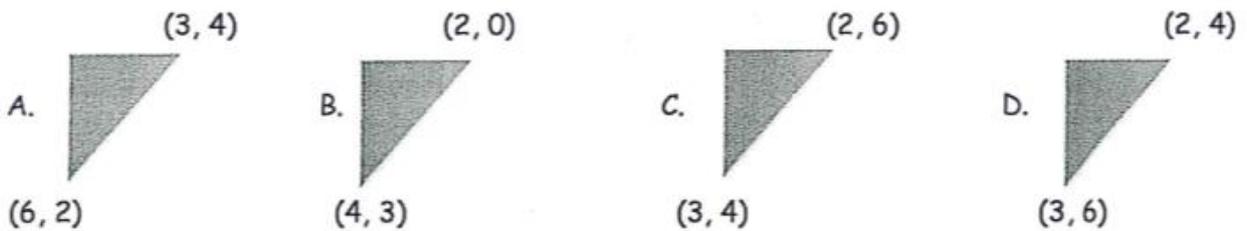
- The Graph below shows a diagonal line on a coordinate plane. A right triangle is drawn so that its hypotenuse (longest side) lies on the line. Which of the following right triangles has a slope that would lie on the same line? (1)



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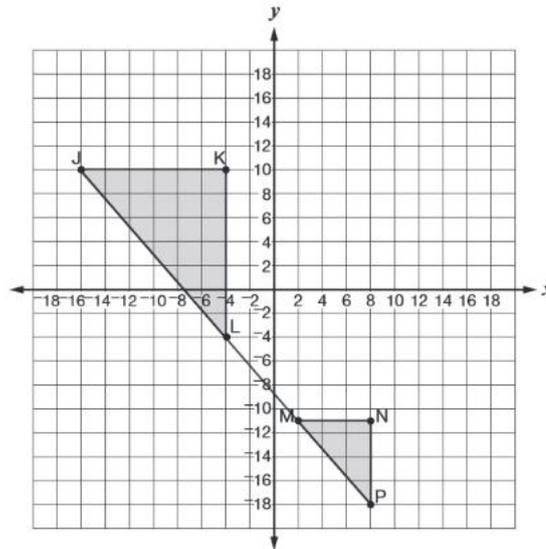
Question 2:

- A triangle has two coordinates of (0,-2) and (-3,0). Which of the following right triangles has a slope that would lie on the same line? (1)



Question 3:

- The diagram below shows  $\triangle JKL$  and  $\triangle MNP$ . Which statement about the slopes of  $JL$  and  $MP$  is true? (1)

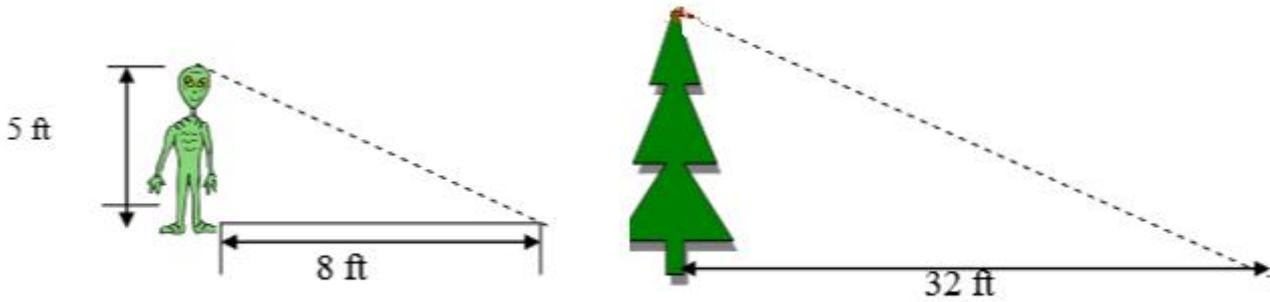


- The slope of  $JL$  is the same as the slope of  $MP$  because  $\triangle JKL$  is similar to  $\triangle MNP$ .
- The slope of  $JL$  is twice the slope of  $MP$  because the length of  $JL$  is twice the length of  $MP$ .
- The slope of  $JL$  is 4 times the slope of  $MP$  because the area of  $\triangle JKL$  is 4 times the area of  $\triangle MNP$ .
- The slope of  $JL$  is 8 more than the slope of  $MP$  because the difference between the short legs of the triangles is 6 and the difference between the long legs of the triangles is 7.

**Section B**

Question 1:

- Lance the alien is 5 feet tall. His shadow is 8 feet long. (1)



At the same time of day, a tree's shadow is 32 feet long. What is the height of the tree?

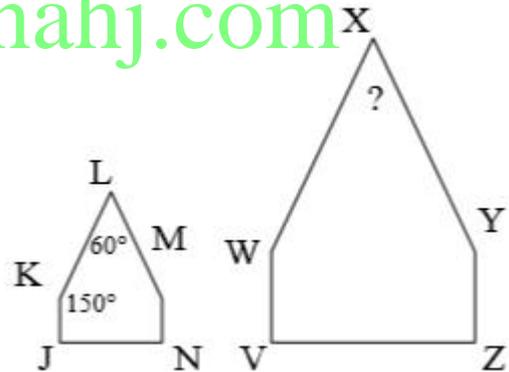
- a) 20 feet    b) 24 feet    c) 29 feet    d) 51 feet

Question 2:

- Pentagon JKLMN is similar to pentagon VWXYZ. (1)

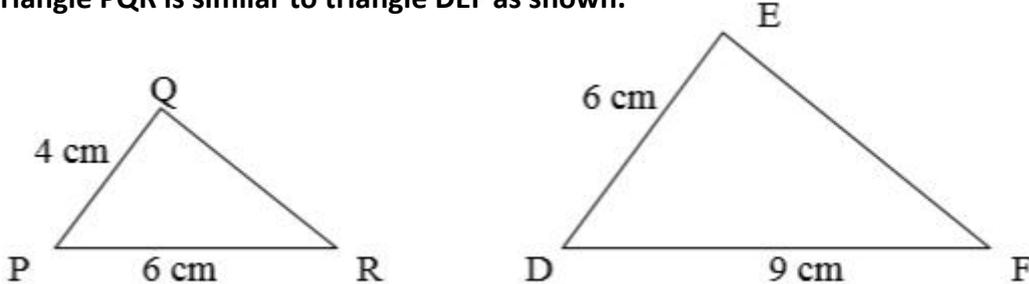
What is the measurement of angle X?

- a) 30°    b) 60°    c) 150°    d) 120°



Question 3:

- Triangle PQR is similar to triangle DEF as shown. (1)



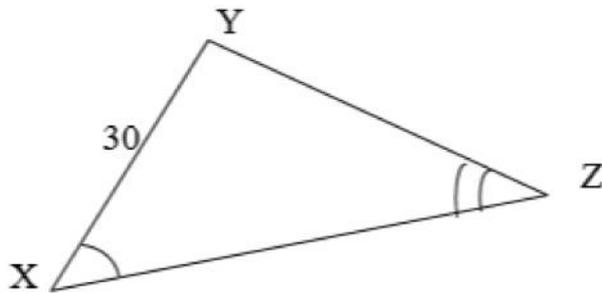
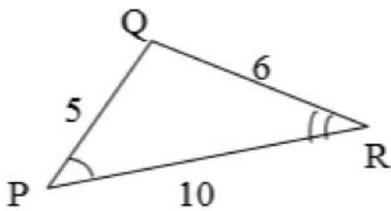
Which describes the relationship between the corresponding sides of the two triangles?

- a)  $\frac{PQ}{DE} = \frac{4}{6}$     b)  $\frac{PQ}{DE} = \frac{6}{4}$     c)  $\frac{PQ}{EF} = \frac{4}{9}$     d)  $\frac{PR}{DE} = \frac{6}{6}$

Question 4:

- $\triangle PQR$  is similar to  $\triangle XYZ$ .

(1)



What is the perimeter of  $\triangle XYZ$ ?

- a) 21 cm    b) 63 cm    c) 105 cm    d) 126 cm

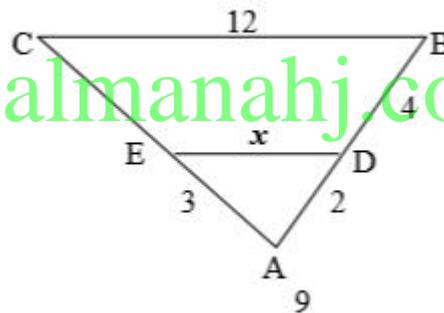
Question 5:

- If triangles  $\triangle ADE$  and  $\triangle ABC$  shown in the figure to the right are similar, what is the value of  $x$ ?

(1)

- a) 4    b) 5    c) 6    d) 8    e) 10

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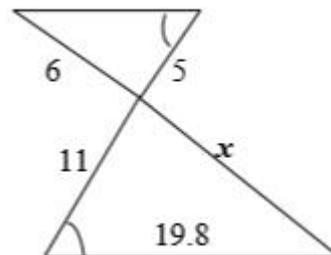


Question 6:

- In the figure to the right, the two triangles are similar. What is the value of  $x$ ?

(1)

- a) 12.4    b) 13.2    c) 14    d) 18.6    e) 22.1



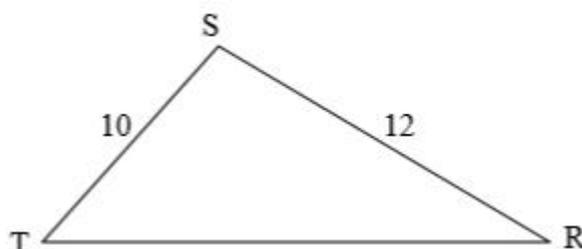
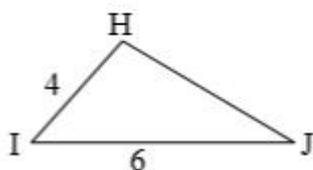
Question 7:

- $\triangle HIJ$  is similar to  $\triangle STR$ .

(1)

What is the perimeter of  $\triangle STR$ ?

- a) 32    b) 37    c) 40    d) 42    e) 120



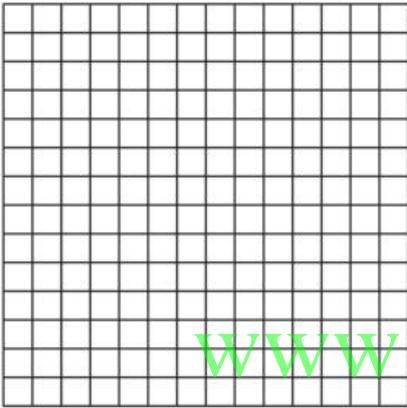
**Section C**

Question 1:

- Graph each pair of similar triangles. Then write a proportion comparing the rise to the run for each of the similar slope triangles and determine the numeric value. (8)

1.  $\triangle ABC$  with vertices  $A(-1, 2)$ ,  $B(5, 4)$ , and  $C(5, 2)$ ;  $\triangle QRS$  with vertices,  $Q(-4, 1)$ ,  $R(8, 5)$ , and  $S(8, 1)$

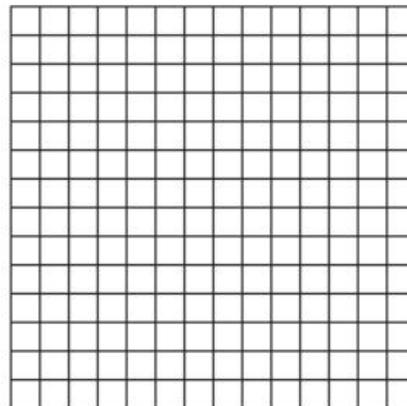
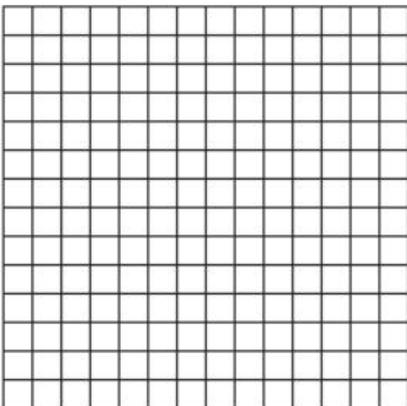
2.  $\triangle PQR$  with vertices  $P(-3, -2)$ ,  $Q(-3, 6)$ , and  $R(7, -2)$ ;  $\triangle LMN$  with vertices,  $L(-0.5, 2)$ ,  $M(-0.5, 4)$ , and  $N(2, 2)$



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3.  $\triangle RST$  with vertices  $R(-9, 2)$ ,  $S(-9, 4)$ , and  $T(6, 2)$ ;  $\triangle XYZ$  with vertices,  $X(-3, -4)$ ,  $Y(-3, 0)$ , and  $Z(3, -4)$

4.  $\triangle DEF$  with vertices  $D(5, 6)$ ,  $E(5, 4)$ , and  $F(4, 4)$ ;  $\triangle GHI$  with vertices,  $G(3, 2)$ ,  $H(3, -4)$ , and  $I(0, -4)$



Al Mutanabi School  
Chapter 8: Surface Area and Volume  
End of Term 3 Exam Review

1. Pi ( $\pi$ ) is used when calculating which of the following?

- a. area of a circle
- b. volume of a sphere
- c. volume of a cylinder
- d. volume of a cone
- e. all of the above

2. Which of the following will hold the greatest volume?

- a. a sphere with a radius of 10 cm
- b. a cube with a side length of 10 cm
- c. a cone with a radius of 10 cm and a height of 10 cm
- d. a cylinder with a radius of 10 cm and a height of 10 cm

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3. What is the formula for the volume of a cylinder?

- a.  $V=l \times w \times h$
- b.  $V=1/3 \pi r^2 h$
- c.  $V=\pi r^2 h$
- d.  $V=4/3 \pi r^3$

4. What is the formula for the volume of a sphere?

- a.  $V=l \times w \times h$
- b.  $V=1/3 \pi r^2 h$
- c.  $V=\pi r^2 h$
- d.  $V=4/3 \pi r^3$

5. What is the formula for the volume of a cone?

- a.  $V=l \times w \times h$
- b.  $V=1/3 \pi r^2 h$
- c.  $V=\pi r^2 h$
- d.  $V=4/3 \pi r^3$

6. Layla's waffle ice cream cone and a sugar ice cream cone hold the same volume of ice cream. The height of the waffle cone is 10 cm and its radius is 5 cm. What is the radius of the sugar cone, to the nearest cm, if its height is 14 cm?

- a. 4 cm
- b. 5 cm
- c. 7 cm
- d. 9 cm

7. Find the volume of a sphere with a radius of 20 mm. Use 3.14 for pi.

- a. 251.2 cubic millimeters
- b. 125.6 cubic millimeters
- c. 100,480 cubic millimeters
- d. 33,493.33 cubic millimeters

8. What is the volume of a cylinder with a radius of 6 cm and a height of 10 cm? Use  $\pi = 3.14$ .

- a.  $1130.4 \text{ cm}^3$
- b.  $1130 \text{ cm}^3$
- c.  $360.8 \text{ cm}^3$
- d.  $600 \text{ cm}^3$

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9. What is the volume of a cone with a radius of 3 feet and a height of 8 feet? (round to nearest tenth if needed)

- a.  $72.7 \text{ ft}^3$
- b.  $75.4 \text{ ft}^3$
- c.  $226 \text{ ft}^3$
- d.  $84.8 \text{ ft}^3$

10. If a hemisphere has a curved surface area of  $175\text{cm}^2$  its radius is

- a. 5.82cm
- b. 3.45cm
- c. 28.5cm
- d. 45.3cm

1. Find the volume of the sphere with a diameter of 24.

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2. Find the volume of the sphere with a diameter of 8.

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3. Find the volume of the right cylinder with a radius of 15 and height of 21.

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4. Find the volume of the right cylinder with a diameter of 42 and height of 16.

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5. Find the volume of the right cylinder with a diameter of 18 and height of 2.

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6. Find the volume of the right cone with a diameter of 20 and height of 10.

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7. Find the volume of the right cone with a diameter of 42 and height of 3.

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8. A cylindrical water tank has a diameter of 2.8 yards and is 6.5 yards high. What is the volume of the tank? Round your answer to the nearest hundredth. (volume of a cylinder =  $\pi r^2 h$ )

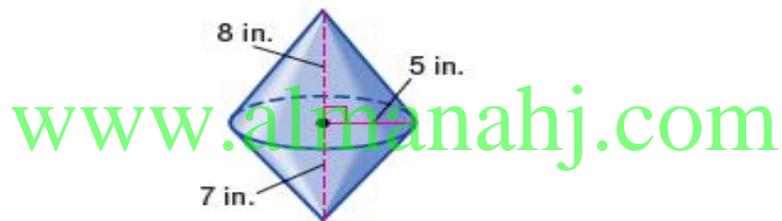
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9. Find the total volume of the cones. Round to the nearest tenth.



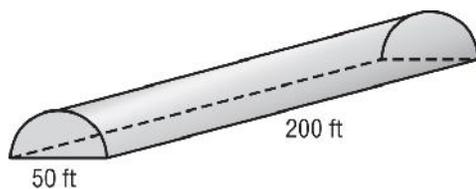
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10. A tunnel over a highway is in the shape of half a cylinder as shown. Find the lateral surface area of the inside of the tunnel. Do not include the bottom which is the highway. Round to the nearest tenth.



Answer Key

1	e
2	a
3	c
4	d
5	b
6	a
7	d
8	a
9	b
10	a

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1. Find the volume of the sphere with a diameter of 24.

- *To find the volume, we use the formula:*

$$V = \frac{4}{3}(\pi)r^3$$

*To find the radius, simply divide the diameter by 2. So we get 12 for our radius.*

*So we get 7238.23.*

2. Find the volume of the sphere with a diameter of 8.

- *To find the volume, we use the formula:*

$$V = \frac{4}{3}(\pi)r^3$$

*To find the radius, simply divide the diameter by 2. So we get 4 for our radius.*

*So we get 268.08.*

3. Find the volume of the right cylinder with a radius of 15 and height of 21.

- 14844.03

4. Find the volume of the right cylinder with a diameter of 42 and height of 16.

- To find the volume, we use the formula:

$$V = Bh$$

Remember:  $B = \text{area of the base}$

To find the radius, simply divide the diameter by 2. So we get 21 for our radius.

So we get 22167.08.

5. Find the volume of the right cylinder with a diameter of 18 and height of 2.

- To find the volume, we use the formula:

$$V = Bh$$

Remember:  $B = \text{area of the base}$

To find the radius, simply divide the diameter by 2. So we get 9 for our radius.

So we get 508.94.

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6. Find the volume of the right cone with a diameter of 20 and height of 10.

- To find the volume, we use the formula:

$$V = \frac{1}{3} Bh$$

Remember:  $B = \text{area of the base}$

To find the radius, simply divide the diameter by 2. So we get 10 for our radius.

So we get 1047.2.

7. Find the volume of the right cone with a diameter of 42 and height of 3.

- To find the volume, we use the formula:

$$V = \frac{1}{3} Bh$$

Remember:  $B = \text{area of the base}$

To find the radius, simply divide the diameter by 2. So we get 21 for our radius.

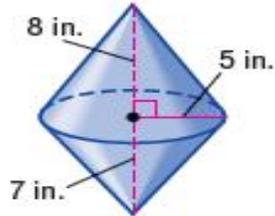
So we get 1385.44.

8. A cylindrical water tank has a diameter of 2.8 yards and is 6.5 yards high. What is the volume of the tank?

Round your answer to the nearest hundredth. (volume of a cylinder =  $\pi r^2$ )

- 40.00 cubic yards

9. Find the volume of each cone. Round to the nearest tenth.



$$V = \frac{1}{3} Bh$$

Remember:  $B$  = area of the base

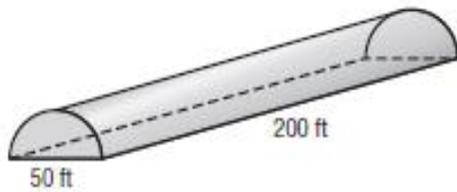
$$209,439 \text{ in}^3 + 183,259 \text{ in}^3$$

$$= 392,7 \text{ in}^3$$

10.

**TUNNEL** A tunnel over a highway is in the shape of half a cylinder as shown. Find the lateral surface area of the inside of the tunnel. Do not include the bottom which is the highway. Round to the nearest tenth.

$$15,708.0 \text{ ft}^2$$



# Chapter 9: Scatter Plots and Data

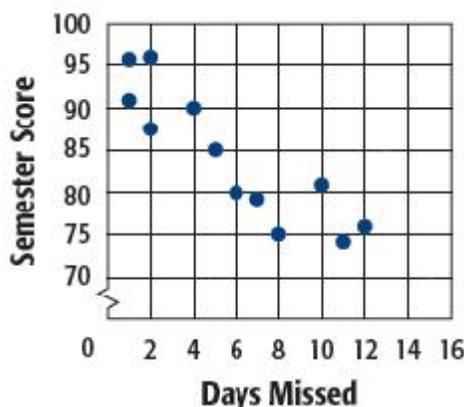
Write the letter for the correct answer in the blank at the right of each question.

For Exercises 1 – 3, use the data in the table that shows number of kilometers run by people in a running club..

Distance Run (km)			
20	28	30	6
15	18	21	22
25	29	24	26

- What is the mean absolute deviation?  
 A. 5                      B. 9.6                      C. 15                      D. 22                      1. \_\_\_\_\_
- What is the median of the data?  
 F. 25                      G. 23                      H. 15.3                      I. no median                      2. \_\_\_\_\_
- What are the first and third quartiles of the data?  
 A. 6, 28                      B. 19, 27                      C. 19, 28.5                      D. 25.5, 27                      3. \_\_\_\_\_
- The standard deviation of the distance run is 6.5. Which of the following best describes the distances that are within one standard deviation of the mean distance run?  
 F. 14 – 26.5 km                      H. 15.5 – 28.5 km                      4. \_\_\_\_\_  
 G. 14 – 28.5 km                      I. 28.5 – 29 km

For Exercises 5 and 6, use the scatter plot at the right that shows the semester score for students that missed some days of school.



- What type of association is shown in the scatter plot?  
 A. positive linear  
 B. negative linear  
 C. nonlinear  
 D. no association                      5. \_\_\_\_\_
- Which of the following is a reasonable estimate for the semester score for a student that missed 20 days of school?  
 F. 75                      G. 73                      H. 70                      I. 60                      6. \_\_\_\_\_
- Which is appropriate to describe the spread of data if the data distribution is *not* symmetric?  
 A. mean                      C. interquartile range  
 B. median                      D. mean absolute deviation                      7. \_\_\_\_\_

(continued)

8. A teacher surveyed the students in the cafeteria and found that 25 males like skiing while 10 do not like skiing. There were 50 females surveyed and 30 of them dislike skiing.

a. Complete the two-way table summarizing the data.

8a, b.	Likes Skiing	Dislikes Skiing	Total
Male			
Female			
Total			

b. Find the relative frequencies of students by rows. Round to the nearest hundredth if necessary. Write the answer in the table.

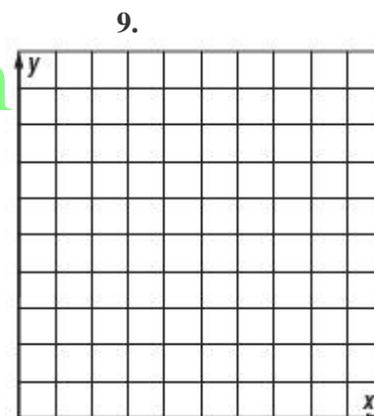
c. Interpret the relative frequencies of students by rows.

8c. \_\_\_\_\_

For Exercises 9-13, use the data in the table below. The table shows the membership for a savings club in the years 2005-2012.

Years Since 2004	1	2	3	4	5	6	7	8
Membership	120	100	110	100	90	75	85	65

9. Construct a scatter plot for the data.



10. Draw and assess a line that seems to best represent the data on the scatter plot.

10. \_\_\_\_\_

11. Write an equation in slope-intercept form for the line of best fit that is drawn.

11. \_\_\_\_\_

12. Interpret the slope and y-intercept of the line of best fit.

12. \_\_\_\_\_

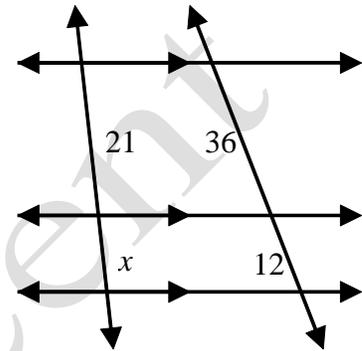
13. Use your equation from Exercise 11 to make a conjecture about the number of savings club members in the year 2014.

13. \_\_\_\_\_

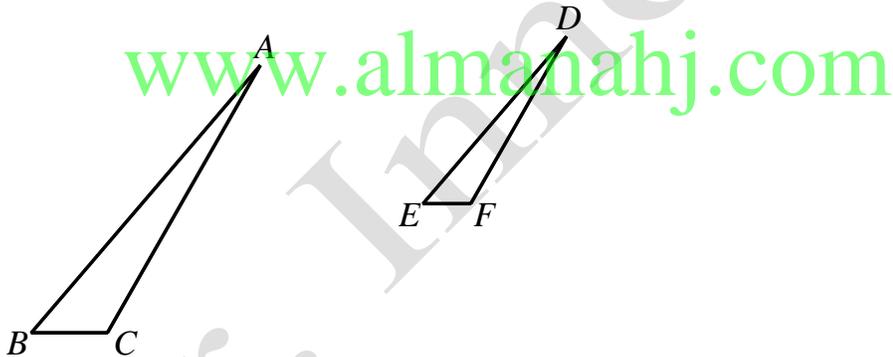
## Ch 7 Mock Exam: Congruency and Similarity

### True or False

- $8/20 = 2:5$ 
  - true
  - false
- Similar triangles are always congruent
  - true
  - false
- In the picture to the right, the value of  $x$  is 7.
  - true
  - false



- The below two shapes are similar.  $\angle BCA \cong \angle EFD$ 
  - true
  - false



- If the ratio of perimeters of 2 similar figures is 4 to 5 then the ratio of their areas is 16 to 25.
  - true
  - false

# Ch 7 Mock Exam: Congruency and Similarity

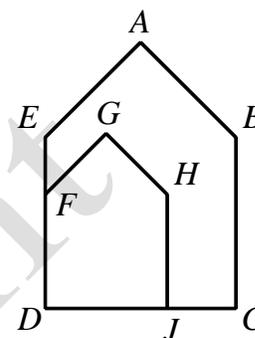
## Multiple Choice

6. If  $\frac{x}{4} = \frac{30}{6}$ , find x. [A] 20 [B] 24 [C] 4/5 [D] 5/4

Use the figure to complete the statements in questions 7 and 8.  
 $ABCDE \sim GHJDF$ .

7.  $\angle H \cong$  ? [A]  $\angle A$  [B]  $\angle B$  [C]  $\angle C$  [D]  $\angle D$

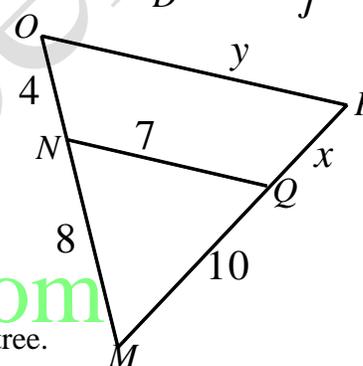
8.  $\frac{GH}{DJ} = \frac{AB}{\square}$  [A] AB [B] BC [C] DC [D] ED



Use the figure to the right to answer questions 9 and 10.

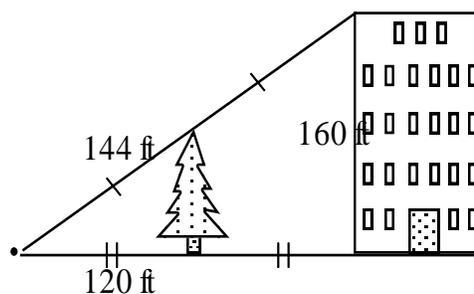
9. Find x. [A] 10.5 [B] 7 [C] 10 [D] 5

10. Find y. [A] 10.5 [B] 7 [C] 10 [D] 5



11. Use the information in the diagram to determine the height of the tree.

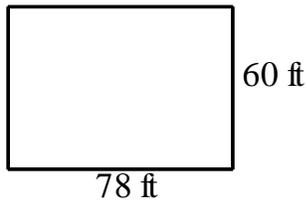
[A] 264 ft [B] 60 ft [C] 72 ft [D] 80 ft



12. Find the geometric mean of 4 and 9.  
 [A] 6.5 [B] 6 [C] 1 [D] 36

## Geometry Ch 7 Test

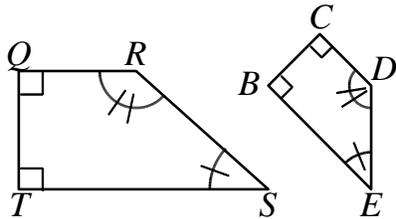
13. Find the ratio of the length to the width of the rectangle. Then simplify the ratio.



- [A]  $\frac{3}{5}$     [B]  $\frac{13}{10}$     [C]  $\frac{78}{60}$     [D]  $\frac{6}{60}$

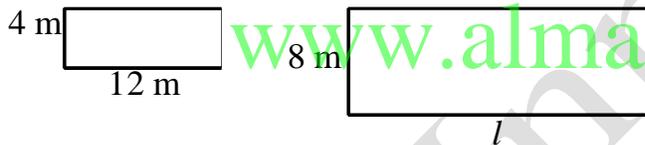
14. Figure  $TQRS \sim$  Figure  $BCDE$ .

Which is a pair of corresponding sides?



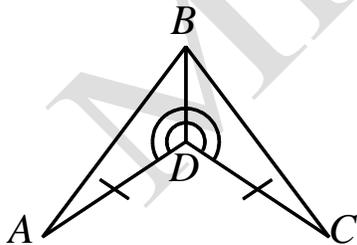
- [A]  $\overline{TS}$  and  $\overline{CD}$     [B]  $\overline{RS}$  and  $\overline{BC}$   
 [C]  $\overline{TQ}$  and  $\overline{BE}$     [D]  $\overline{QR}$  and  $\overline{CD}$

15. The two rectangles are similar. Which is a correct proportion between corresponding sides?



- [A]  $\frac{12}{8} = \frac{l}{4}$     [B]  $\frac{12}{4} = \frac{l}{20}$     [C]  $\frac{12}{4} = \frac{l}{8}$     [D]  $\frac{4}{12} = \frac{l}{8}$

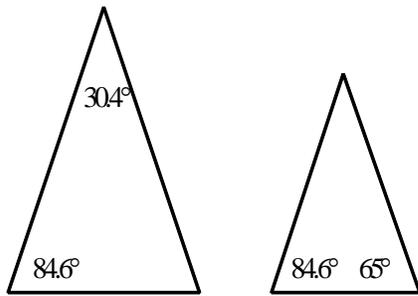
16. State whether  $\triangle ADB \sim \triangle CDB$ , and if so, identify the correct similarity statement.



- [A] Yes, AA  
 [B] Yes, SSS  
 [C] Yes, SAS  
 [D] none of these

17. Are the triangles similar?

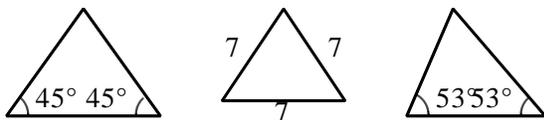
# Geometry Ch 7 Test



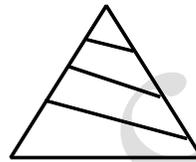
- [A] Yes, by AA
- [B] Yes, by SSS
- [C] Yes, by SAS
- [D] No

18. Which group contains triangles that are all similar triangles?

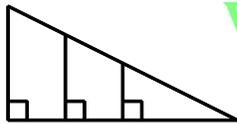
[A]



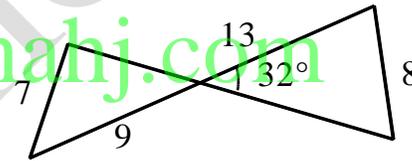
[C]



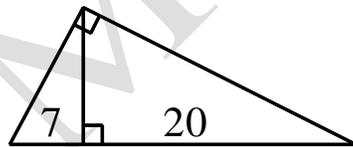
[B]



[D]



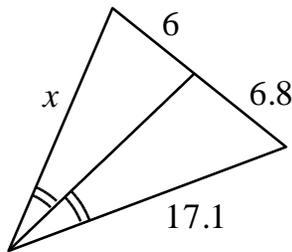
19. Find the length of the altitude drawn to the hypotenuse.



- [A]  $3\sqrt{3}$
- [B]  $3\sqrt{21}$
- [C]  $2\sqrt{35}$
- [D]  $6\sqrt{15}$

## Geometry Ch 7 Test

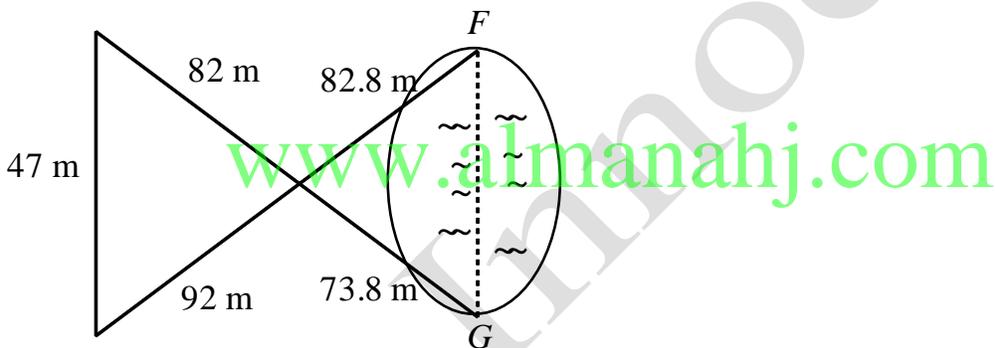
20. Find  $x$  to the nearest tenth.



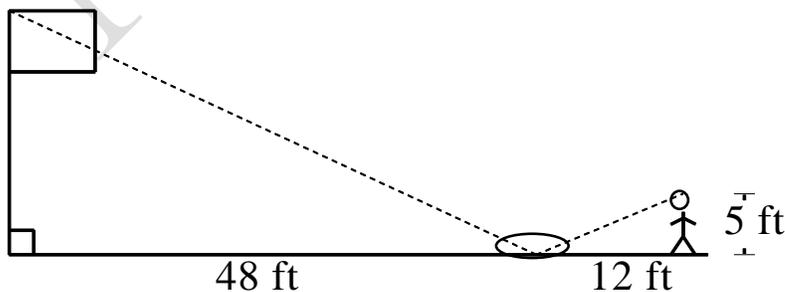
- [A] 15.1
- [B] 15.3
- [C] 16
- [D] 14.6

**Short Answer. Answer each problem completely. Show all work.**

21. Campsites  $F$  and  $G$  are on opposite sides of a lake. A survey crew made the measurements shown on the diagram. What is the distance between the two campsites? The diagram is not to scale.



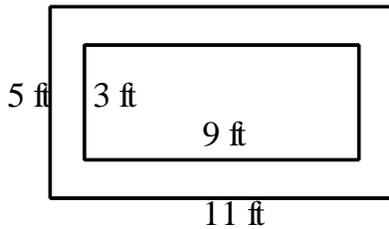
22. Michele wanted to measure the height of her school's flagpole. She placed a mirror on the ground 48 feet from the flagpole, then walked backwards until she was able to see the top of the pole in the mirror. Her eyes were 5 feet above the ground and she was 12 feet from the mirror. Using similar triangles, find the height of the flagpole to the nearest hundredth of a foot.



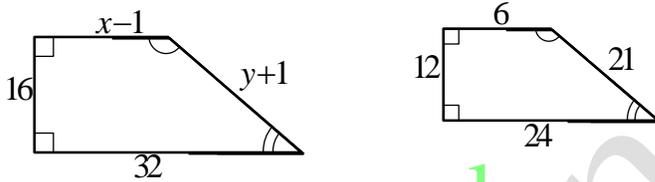
## Geometry Ch 7 Test

23. Two trapezoids have areas  $432 \text{ cm}^2$  and  $48 \text{ cm}^2$ . Find their ratio of similarity.

24. Find the ratio of the perimeter of the larger rectangle to the perimeter of the smaller rectangle.



25. The polygons below are similar, but not necessarily drawn to scale. Find the values of  $x$  and  $y$ .



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# Geometry Ch 7 Test

## Answer Key

### True/False

1. a
2. b
3. a
4. a
5. a

### Multiple Choice

6. A
7. B
8. C
9. D
10. A
11. D
12. D
13. B
14. D
15. C
16. C
17. A
18. B
19. C
20. A

### Short Answer

21. 42.3 m
22. 20 ft
23. 3 : 1
24. 4 : 3
25.  $x = 9, y = 27$

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