

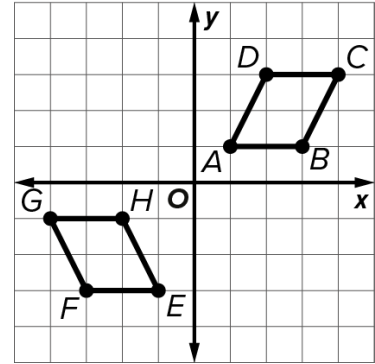
1. Consider quadrilaterals $ABCD$ and $EFGH$.

Part A Are the quadrilaterals congruent?

yes

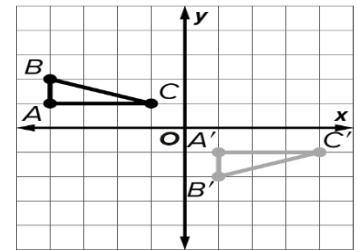
Part B If the quadrilaterals are congruent, describe the sequence of transformations that maps quadrilateral $ABCD$ onto quadrilateral $EFGH$. If the figures are not congruent, explain why they are not congruent.

Sample answer: Reflect quadrilateral $ABCD$ about the y -axis and then translate down 4 units to map quadrilateral $ABCD$ onto quadrilateral $EFGH$.



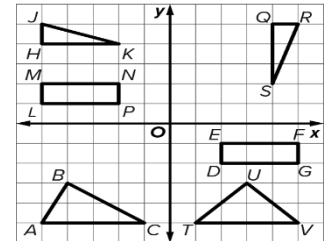
2. Triangle ABC is congruent to triangle $A'B'C'$. Which sequence of transformations maps triangle ABC to triangle $A'B'C'$?

- (A) reflection across the x -axis, followed by a translation down 1 unit
(B) reflection across x -axis, followed by a translation down 4 units
(C) translation right 5 units, followed by a reflection about the x -axis
(D) reflection across the y -axis, followed by 180° clockwise rotation about the origin



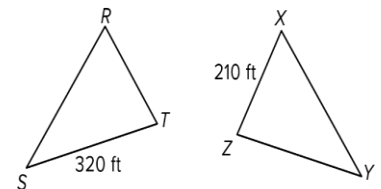
3. Which pair of figures are congruent based on a translation 7 units left and 3 units up?

- (A) $DEFG \cong LMNP$
(B) $\triangle HJK \cong \triangle QRS$
(C) $\triangle ABC \cong \triangle VUT$
(D) $\triangle ABC \cong \triangle QRS$



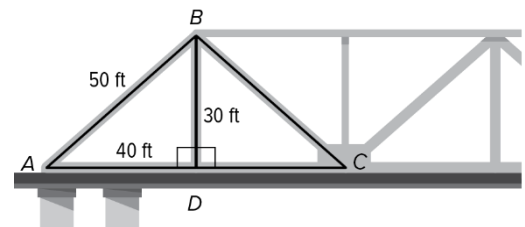
4. The figure shows the dimensions of two buildings, where $\triangle RST \cong \triangle XYZ$ and $\overline{XY} \cong \overline{YZ}$. The city wants to put sidewalks around both individual buildings. What is the total length of sidewalk around both buildings? Explain your reasoning.

Sample answer: $\overline{YZ}$ is congruent to $\overline{ST}$, so $YZ = 320$ ft. $\overline{XY}$ is congruent to $\overline{YZ}$, so $XY = 320$ ft. Since the triangles are congruent they have the same perimeter. The perimeter of $\triangle XYZ = 320 + 320 + 210 = 850$ ft. So, the total length of sidewalk is $850 \times 2 = 1,700$ feet.



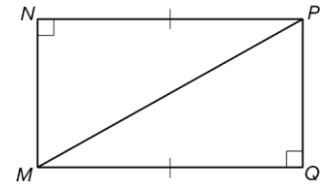
5. A truss bridge has the dimensions shown in the figure. If the triangles are congruent, what is the perimeter of triangle ABC ?

- (A) 80 ft
(B) 90 ft
(C) 140 ft
(D) 180 ft



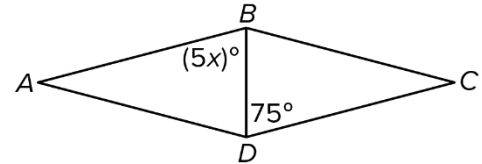
6. The diagram represents a rectangular flower garden. NP is 20 feet and MP is 25 feet. What is the length of PQ ?

15 feet



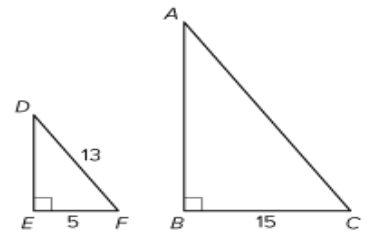
7. Consider the following triangles, where $\triangle DAB \cong \triangle BCD$. Determine the value of x .

15



8. Triangle ABC is similar to $\triangle DEF$. Which statement is true? Select all that apply.

- ☐ A $AB = 12$
☒ B $AC = 39$
☒ C The perimeter of $\triangle ABC$ is 90 units.
☐ D The area of $\triangle DEF$ is 60 square units.
☒ E The area of $\triangle ABC$ is 270 square units.



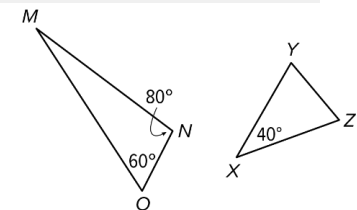
9. Jamie wants to enlarge or reduce the photograph with the dimensions shown. Which of the following dimensions could Jamie not choose as an enlargement or reduction for her photograph?

- ☐ A 4 in. by 6 in.
☒ B 9 in. by 13 in.
☐ C 10 in. by 15 in.
☐ D 12 in. by 18 in.



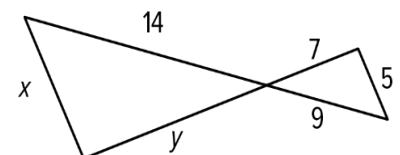
10. What measure for $\angle Z$ would make $\triangle MNO$ similar to $\triangle XYZ$?

60°



11. The triangles shown are similar. If the side with length 14 units corresponds to the side with length 9 units, write a proportion that could be used to solve for y .

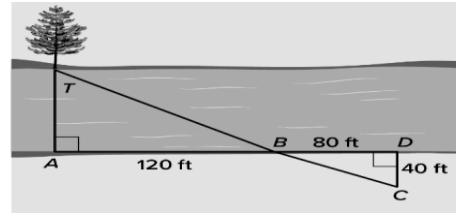
Sample answer: $\frac{14}{9} = \frac{y}{7}$



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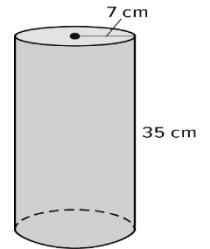
12. A surveyor made a diagram after taking measurements along a river. If $\triangle TAB \sim \triangle CDB$, what is the distance across the river?

60 ft



13. What is the volume of the cylinder? Round to the nearest tenth.

- Ⓐ 5,387.8 cm³
 Ⓑ 2,693.9 cm³
 Ⓒ 769.7 cm³
 Ⓓ 245.1 cm³

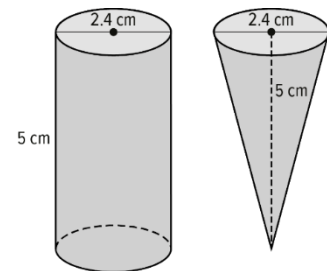


14. An aquarium at the zoo is shaped like a cylinder. It has a height of 4 feet and a base radius of 2.5 feet. The aquarium is being filled with water at a rate of 12 gallons per minute. If one cubic foot is about 7.5 gallons, how long will it take the aquarium to fill? Round to the nearest whole minute.

49 inutes

15. Juniata compares a conical and a cylindrical paper cup for use in her business. The cups have the dimensions shown.

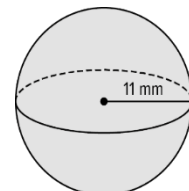
Part A Suppose both cups are completely filled with liquid. Find the volume of each cup. Round each volume to the nearest tenth.

cylindrical cup: 22.6 cm³conical cup: 7.5 cm³

Part B Juniata plans to fill the cup with a fermented tea that costs \$0.05 per milliliter. If 1 cubic centimeter equals 1 milliliter, about how much more will the cylindrical cup cost than the conical cup to completely fill with tea? Round to the nearest cent.

\$0.76

16. What is the volume of the ball? Round to the nearest tenth.

5,575.3 mm³

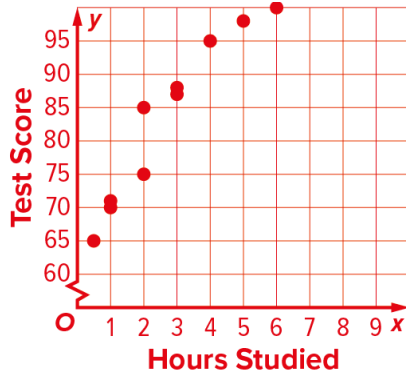
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- 17 Consider the following table representing the number of hours studied x and the resulting test score earned y .

studied, x	Score, y
5	98
6	100
4	95
2	85
3	87
1	70
2	75
3	88
0.5	65
1	71

Part A Construct a scatter plot that displays the relationship between the number of hours studied and the test score earned.

Sample answer:



Part B Which of the following is the best interpretation of the scatter plot?

- Ⓐ negative, nonlinear association
- Ⓑ negative, linear association
- Ⓒ positive, nonlinear association
- Ⓓ positive, linear association
- 18 A coach compares the number of athletes who reach their goals during a physical fitness test with the number of hours each athlete slept the night before the test. Which of the following statements is accurate about the association shown in the table?

	More Hours of Sleep	Than 7 Hours of Sleep	Total
Goal Reached	28	20	48
Goal Not Reached	54	98	152
Total	82	118	200

- Ⓐ About 34% of the athletes who got more than 7 hours of sleep achieved their goal but only about 17% of those who got less than 7 hours of sleep achieved their goal.
- Ⓑ Fewer than 50% of the athletes who achieved their goal got 7 more hours of sleep.
- Ⓒ Only 15% of the athletes achieved their goal.
- Ⓓ There is no evidence of any association between the categories.

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- 19 The two-way table shows the results of a survey of juniors and seniors who were asked if they plan to attend college or seek full-time employment after graduation. What is the relative frequency of a randomly selected junior who plans to seek full-time employment?

	Attend College	Seek Full-Time Employment	Total
Juniors	23	27	50
Seniors	35	15	50
Total	58	42	100

- (A) 0.54 (B) 0.64 (C) 0.7 (D) 0.84

- 20 Mrs. Snider surveyed 25 students to determine the number who have traveled to Canada or Mexico. Of the students surveyed, 6 have traveled to Mexico and Canada, 3 have not traveled to Canada but have traveled to Mexico, and 5 have traveled to Canada but not to Mexico. How many students have not traveled to either Canada or Mexico? Explain how you found your answer.

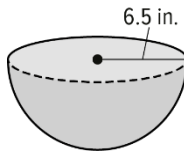
11 students; Sample answer: Make a two-way table of the data.

	Mexico	Not Mexico	Total
Canada	6	5	11
Not Canada	3	11	14
Total	9	16	25

So, 11 students have not traveled to either Canada or Mexico.

- 21 Rachel has a bowl shaped like a hemisphere. Which of the following statements about the bowl are accurate? Select all that apply.

- (A) The volume of the bowl, rounded to the nearest tenth is 575.2 cubic inches.
 (B) The volume of the bowl, rounded to the nearest tenth, is 248.8 cubic inches.
 (C) The area of the opening of the bowl is 862.8 square inches.
 (D) The area of the opening of the bowl is 132.7 square inches.
 (E) The volume of the bowl is three times the area of the opening of the bowl.



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