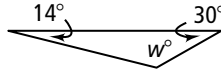


Standardized Test Prep

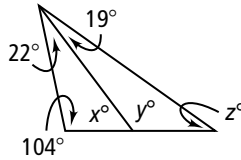
Parallel Lines and Triangles

Gridded Response

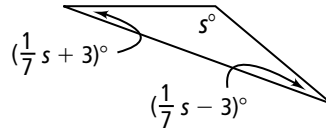
1. What is the value of w ?



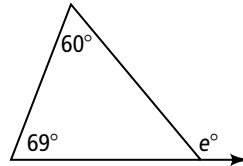
2. What is the value of z ?



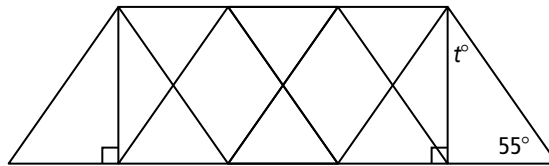
3. What is the value of s ?



4. What is the value of e ?



5. What is the value of t on the truss of the bridge?



Answers

1.

-	0	1	2	3	4
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

2.

-	0	1	2	3	4
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

3.

-	0	1	2	3	4
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

4.

-	0	1	2	3	4
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

5.

-	0	1	2	3	4
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
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7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Standardized Test Prep

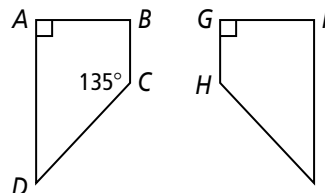
Congruent Figures

Multiple Choice

For Exercises 1–6, choose the correct letter.

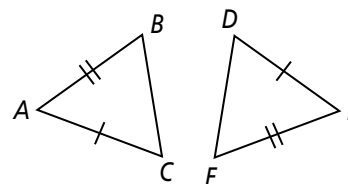
1. The pair of polygons at the right is congruent. What is $m\angle J$?

- Ⓐ 45 Ⓒ 135
 Ⓑ 90 Ⓓ 145



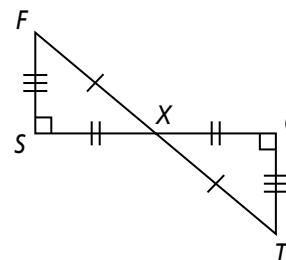
2. The triangles at the right are congruent. Which of the following statements must be true?

- Ⓕ $\angle A \cong \angle D$ Ⓗ $\overline{AB} \cong \overline{DE}$
 Ⓖ $\angle B \cong \angle E$ Ⓘ $\overline{BC} \cong \overline{FD}$



3. Given the diagram at the right, which of the following must be true?

- Ⓐ $\triangle XS F \cong \triangle XT G$ Ⓒ $\triangle FX S \cong \triangle XGT$
 Ⓑ $\triangle SX F \cong \triangle GXT$ Ⓓ $\triangle FX S \cong \triangle GXT$



4. If $\triangle RST \cong \triangle XYZ$, which of the following need not be true?

- Ⓕ $\angle R \cong \angle X$ Ⓖ $\angle T \cong \angle Z$ Ⓗ $\overline{RT} \cong \overline{XZ}$ Ⓙ $\overline{SR} \cong \overline{YZ}$

5. If $\triangle ABC \cong \triangle DEF$, $m\angle A = 50$, and $m\angle E = 30$, what is $m\angle C$?

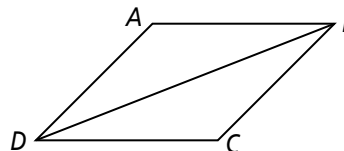
- Ⓐ 30 Ⓑ 50 Ⓒ 100 Ⓓ 120

6. If $ABCD \cong QRST$, $m\angle A = x - 10$, and $m\angle Q = 2x - 30$, what is $m\angle A$?

- Ⓕ 10 Ⓖ 20 Ⓗ 30 Ⓙ 40

Short Response

7. **Given:** $\overline{AB} \parallel \overline{DC}$, $\overline{AD} \parallel \overline{BC}$, $\overline{AB} \cong \overline{CD}$, $\overline{AD} \cong \overline{CB}$
Prove: $\triangle ABD \cong \triangle CDB$



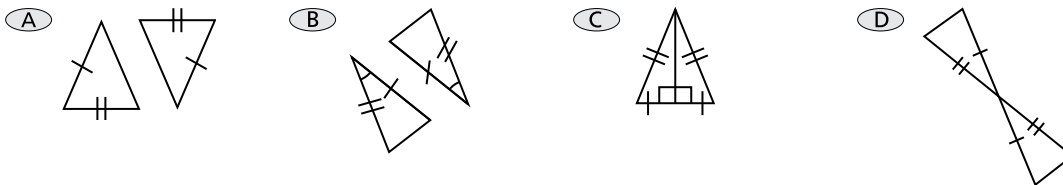
Standardized Test Prep

Triangle Congruence by SSS and SAS

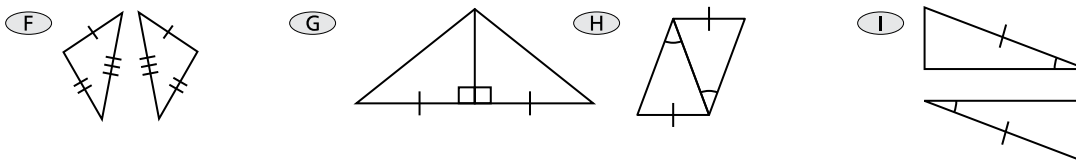
Multiple Choice

For Exercises 1–4, choose the correct letter.

1. Which pair of triangles can be proved congruent by SSS?

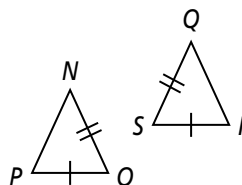


2. Which pair of triangles can be proved congruent by SAS?



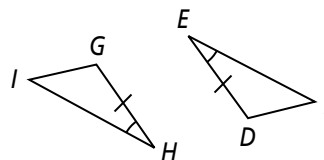
3. What additional information do you need to prove $\triangle NOP \cong \triangle QSR$?

- (A) $\overline{PN} \cong \overline{SQ}$ (C) $\angle P \cong \angle S$
 (B) $\overline{NO} \cong \overline{QR}$ (D) $\angle O \cong \angle S$



4. What additional information do you need to prove $\triangle GHI \cong \triangle DEF$?

- (F) $\overline{HI} \cong \overline{EF}$ (H) $\angle F \cong \angle G$
 (G) $\overline{HI} \cong \overline{ED}$ (I) $\overline{GI} \cong \overline{DF}$

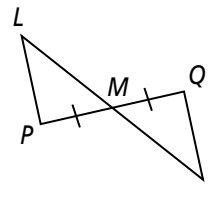


Short Response

5. Write a two-column proof.

Given: M is the midpoint of \overline{LS} , $\overline{PM} \cong \overline{QM}$.

Prove: $\triangle LMP \cong \triangle SMQ$



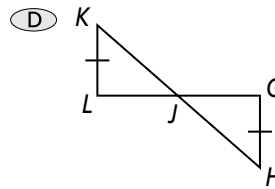
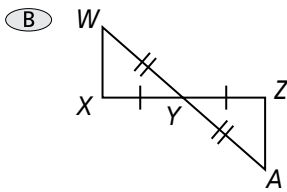
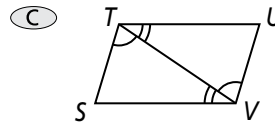
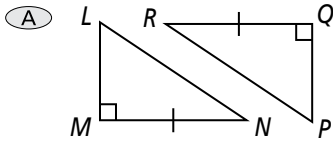
Standardized Test Prep

Triangle Congruence by ASA and AAS

Multiple Choice

For Exercises 1–4, choose the correct letter.

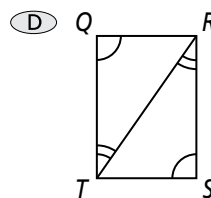
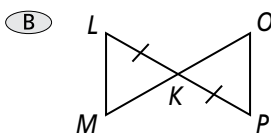
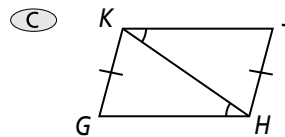
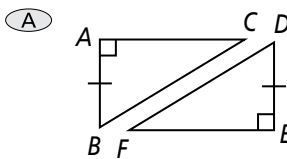
1. Which pair of triangles can be proven congruent by the ASA Postulate?



2. For the ASA Postulate to apply, which side of the triangle must be known?

- (F) the included side (H) the shortest side
 (G) the longest side (I) a non-included side

3. Which pair of triangles can be proven congruent by the AAS Theorem?



4. For the AAS Theorem to apply, which side of the triangle must be known?

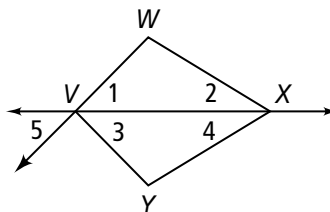
- (F) the included side (H) the shortest side
 (G) the longest side (I) a non-included side

Short Response

5. Write a paragraph proof.

Given: $\angle 3 \cong \angle 5$, $\angle 2 \cong \angle 4$

Prove: $\triangle VWX \cong \triangle VYX$



Standardized Test Prep

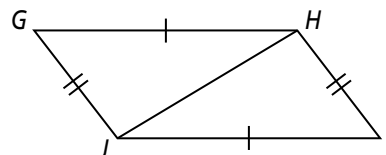
Using Corresponding Parts of Congruent Triangles

Multiple Choice

For Exercises 1–6, choose the correct letter.

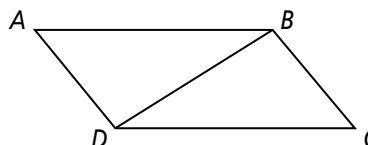
1. Based on the given information in the figure at the right, how can you justify that $\triangle JHG \cong \triangle HJI$?

- (A) ASA (C) AAS
(B) SSS (D) ASA



2. In the figure at the right the following is true: $\angle ABD \cong \angle CDB$ and $\angle DBC \cong \angle BDA$. How can you justify that $\triangle ABD \cong \triangle CDB$?

- (F) SAS (H) ASA
(G) SSS (I) CPCTC



3. $\triangle BRM \cong \triangle KYZ$. How can you justify that $\overline{YZ} \cong \overline{RM}$?

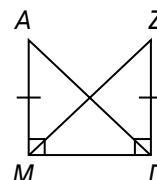
- (A) CPCTC (B) SAS (C) ASA (D) SSS

4. Which statement *cannot* be justified given only that $\triangle PBJ \cong \triangle TIM$?

- (F) $\overline{PB} \cong \overline{TI}$ (G) $\angle B \cong \angle I$ (H) $\angle BJP \cong \angle IMT$ (I) $\overline{JP} \cong \overline{MI}$

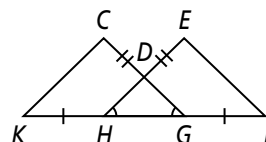
5. In the figure at the right, which theorem or postulate can you use to prove $\triangle ADM \cong \triangle ZMD$?

- (A) ASA (C) SAS
(B) SSS (D) AAS



6. In the figure at the right, which theorem or postulate can you use to prove $\triangle KGC \cong \triangle FHE$?

- (F) ASA (H) SAS
(G) SSS (I) AAS

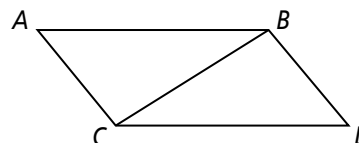


Short Response

7. What would a brief plan for the following proof look like?

Given: $\overline{AB} \cong \overline{DC}$, $\angle ABC \cong \angle DCB$

Prove: $\overline{AC} \cong \overline{DB}$



Standardized Test Prep

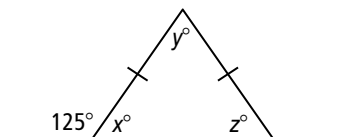
Isosceles and Equilateral Triangles

Gridded Response

Solve each exercise and enter your answer on the grid provided.

Refer to the diagram for Exercises 1–3.

1. What is the value of x ?



2. What is the value of y ?

3. What is the value of z ?

4. The measures of two of the sides of an equilateral triangle are $3x + 15$ in. and $7x - 5$ in. What is the measure of the third side in inches?

5. In $\triangle GHI$, $HI = GH$, $m\angle IHG = 3x + 4$, and $m\angle IGH = 2x - 24$. What is $m\angle HIG$?

Answers

1.

⊖	⊕	⊕	⊕	⊕	⊕
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

2.

⊖	⊕	⊕	⊕	⊕	⊕
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

3.

⊖	⊕	⊕	⊕	⊕	⊕
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

4.

⊖	⊕	⊕	⊕	⊕	⊕
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

5.

⊖	⊕	⊕	⊕	⊕	⊕
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

Standardized Test Prep

Congruence in Right Triangles

Multiple Choice

For Exercises 1–4, choose the correct letter.

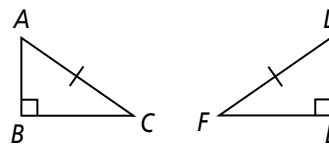
1. Which additional piece of information would allow you to prove that the triangles are congruent by the HL theorem?

(A) $m\angle DFE = 40$

(C) $\overline{AB} \cong \overline{DE}$

(B) $m\angle F = m\angle ABC$

(D) $\overline{AC} \cong \overline{DF}$



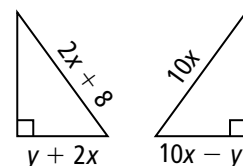
2. For what values of x and y are the triangles shown congruent?

(F) $x = 1, y = 4$

(H) $x = 4, y = 1$

(G) $x = 2, y = 4$

(I) $x = 1, y = 3$



3. Two triangles have two pairs of corresponding sides that are congruent. What else must be true for the triangles to be congruent by the HL Theorem?

(A) The included angles must be right angles.

(B) They have one pair of congruent angles.

(C) Both triangles must be isosceles.

(D) There are right angles adjacent to just one pair of congruent sides.

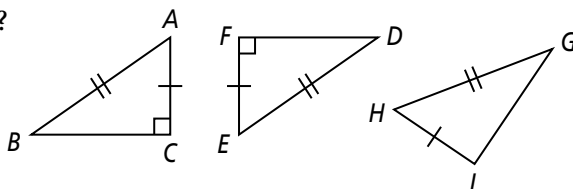
4. Which of the following statements is true?

(F) $\triangle BAC \cong \triangle GHI$ by SAS.

(G) $\triangle DEF \cong \triangle GHI$ by SAS.

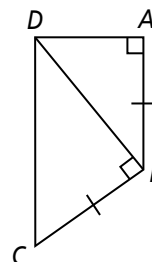
(H) $\triangle BAC \cong \triangle DEF$ by HL.

(I) $\triangle DEF \cong \triangle GHI$ by HL.



Extended Response

5. Are the given triangles congruent by the HL Theorem? Explain.



Standardized Test Prep

The Polygon Angle-Sum Theorems

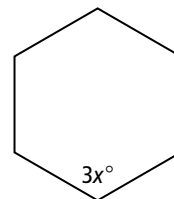
Gridded Response

Solve each exercise and enter your answer on the grid provided.

1. What is the sum of the interior angle measures of a regular octagon?

2. What is the measure of one interior angle of a regular 12-gon?

3. What is the value of x in the regular polygon at the right?



4. What is the measure of an exterior angle of a regular octagon?

5. If the measure of an exterior angle of a regular polygon is 24, how many sides does the polygon have?

Answers

1.

−	0	1	2	3
○	○	○	○	○
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

2.

−	0	1	2	3
○	○	○	○	○
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

3.

−	0	1	2	3
○	○	○	○	○
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

4.

−	0	1	2	3
○	○	○	○	○
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
6	6	6	6	6
7	7	7	7	7
8	8	8	8	8
9	9	9	9	9

5.

−	0	1	2	3
○	○	○	○	○
0	0	0	0	0
1	1	1	1	1
2	2	2	2	2
3	3	3	3	3
4	4	4	4	4
5	5	5	5	5
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9	9	9	9	9

Standardized Test Prep

Properties of Parallelograms

Multiple Choice

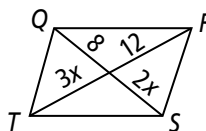
For Exercises 1–5, choose the correct letter.

1. In $\square ABCD$, $m\angle A = 53$. What is $m\angle C$?

- (A) 37 (B) 53 (C) 127 (D) 307

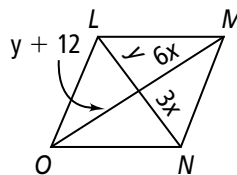
2. What is the value of x in $\square QRST$?

- (F) 16 (H) 8
(G) 12 (I) 4



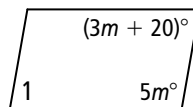
3. What is the value of y in $\square LMNO$?

- (A) 4 (C) 12
(B) 6 (D) 24



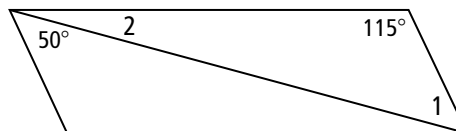
4. What is $m\angle 1$ in this parallelogram?

- (F) 20 (H) 80
(G) 60 (I) 100



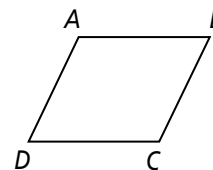
5. What is $m\angle 2$ in this parallelogram?

- (A) 115 (C) 15
(B) 50 (D) 2



Extended Response

6. Figure $ABCD$ is a parallelogram. What are four geometric attributes you know because $ABCD$ is a parallelogram?



Standardized Test Prep

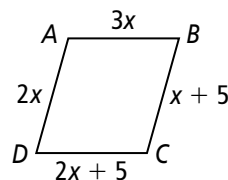
Proving That a Quadrilateral Is a Parallelogram

Multiple Choice

For Exercises 1–4, choose the correct letter.

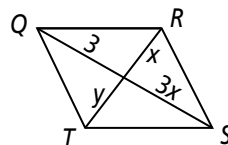
1. For what value of x must $ABCD$ be a parallelogram?

- Ⓐ 5 Ⓒ 15
 Ⓑ 10 Ⓓ 20



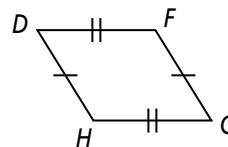
2. For what value of y must $QRST$ be a parallelogram?

- Ⓕ 0.5 Ⓗ 2
 Ⓖ 1 Ⓘ 3



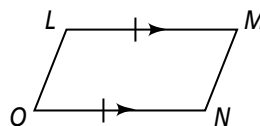
3. Which reason can be used to conclude that $DFGH$ is a parallelogram?

- Ⓐ There are two pairs of congruent opposite angles.
 Ⓑ The diagonals bisect each other.
 Ⓒ There are two pairs of congruent opposite sides.
 Ⓓ There are two pairs of opposite parallel sides.



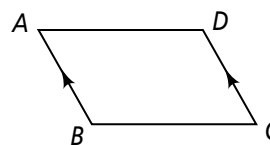
4. Which reason can be used to conclude that $LMNO$ is a parallelogram?

- Ⓕ There are two pairs of congruent opposite angles.
 Ⓖ There are two pairs of congruent opposite sides.
 Ⓗ There are two pairs of opposite parallel sides.
 Ⓘ There is one pair of congruent and parallel sides.



Short Response

5. What additional pieces of information could be supplied to make $ABCD$ a parallelogram?



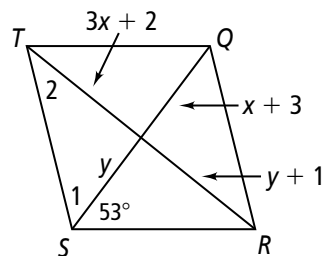
Standardized Test Prep

Properties of Rhombuses, Rectangles, and Squares

Multiple Choice

For Exercises 1–6, choose the correct letter.

Use rhombus $TQRS$ for Exercises 1–4.



- What is the measure of $\angle 1$?

(A) 47 (C) 74
(B) 37 (D) 53
- What is the measure of $\angle 2$?

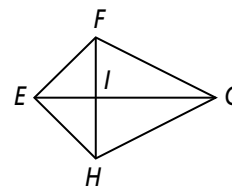
(F) 47 (G) 74 (H) 37 (I) 53
- What is the value of x ?

(A) 2 (B) 1 (C) 5 (D) 4
- What is the value of y ?

(F) 4 (G) 3 (H) 2 (I) 1
- What statement would be sufficient to prove that a quadrilateral is a rhombus?

(A) The quadrilateral has four congruent angles.
(B) The quadrilateral has two pairs of parallel sides.
(C) The quadrilateral has four congruent sides.
(D) The quadrilateral has two pairs of congruent angles.
- $EFGH$ is a kite. To prove that the diagonals of a kite are perpendicular, which pair of angles must you prove congruent using CPCTC?

(F) $\angle EFI$ and $\angle EHI$ (H) $\angle EIF$ and $\angle EIH$
(G) $\angle GFI$ and $\angle GHI$ (I) $\angle FIE$ and $\angle HIG$



Short Response

- Why is it that the statement “all rhombuses are squares” is false, but the statement “all squares are rhombuses” is true? Explain.

Standardized Test Prep

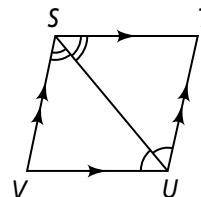
Conditions for Rhombuses, Rectangles, and Squares

Multiple Choice

For Exercises 1–4, choose the correct letter.

1. Which is the most precise name of this figure?

- (A) parallelogram (C) rectangle
 (B) rhombus (D) square



2. Which of the following conditions or set of conditions must be met for a parallelogram to be a rectangle?

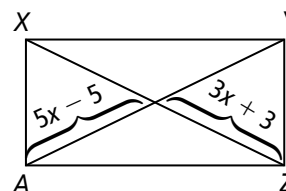
- (F) Diagonals are perpendicular.
 (G) Diagonals are congruent.
 (H) All sides are congruent.
 (I) The length of a diagonal is equal to the length of a side.

3. Which of the following conditions or set of conditions is sufficient for a parallelogram to be a square?

- (A) Diagonals are perpendicular and diagonals are congruent.
 (B) Diagonals are congruent.
 (C) All sides are congruent.
 (D) The length of a diagonal is equal to the length of a side.

4. For what value of x is $\square XYZA$ a rectangle?

- (F) 2 (H) 4
 (G) 3 (I) 5



Short Response

5. The diagonals of a parallelogram are 2.3 cm and 3.2 cm long. Can you tell if the parallelogram is a rhombus? Explain.

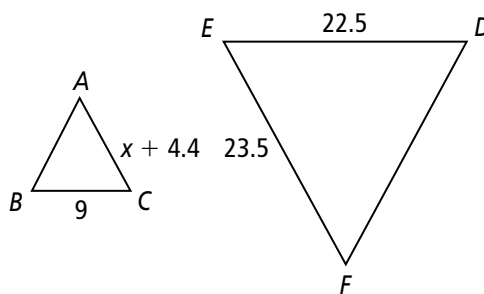
Standardized Test Prep

Similar Polygons

Multiple Choice

For Exercises 1–5, choose the correct letter.

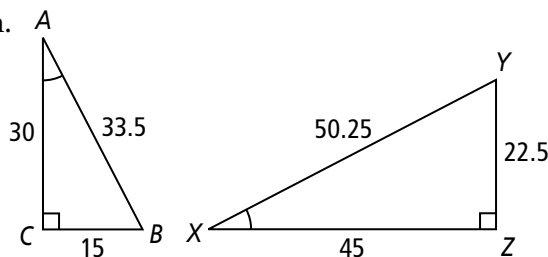
- You make a scale drawing of a tree using the scale 5 in. = 27 ft. If the tree is 67.5 ft tall, how tall is the scale drawing?
 A 10 in. B 11.5 in. C 12 in. D 12.5 in.
- You make a scale drawing of a garden plot using the scale 2 in. = 17 ft. If the length of a row of vegetables on the drawing is 3 in., how long is the actual row?
 F 17 ft G 25.5 ft H 34 ft I 42.5 ft
- The scale factor of $\triangle RST$ to $\triangle DEC$ is 3 : 13. What is the scale factor of $\triangle DEC$ to $\triangle RST$?
 A 3 : 13 B 1 : 39 C 39 : 1 D 13 : 3
- $\triangle ACB \sim \triangle FED$. What is the value of x ?



- F 4 G 4.2 H 4.5 I 5
- $MNOP \sim QRST$ with a scale factor of 5 : 4. $MP = 85$ mm. What is the value of QT ?
 A 60 mm B 68 mm C 84 mm D 106.25 mm

Short Response

- Are the triangles at the right similar? Explain.



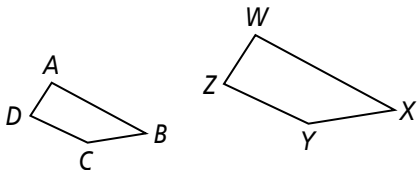
Practice

Form K

Similar Polygons

List the pairs of congruent angles and the extended proportion that relates the corresponding sides for the similar polygons.

1. $ABCD \sim WXYZ$

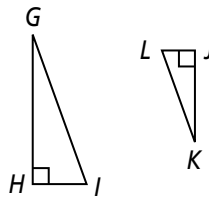


$$\angle A \cong \angle W \qquad \angle B \cong \square$$

$$\angle C \cong \square \qquad \angle D \cong \square$$

$$\frac{AB}{WX} = \frac{BC}{XY} = \frac{\square}{\square} = \frac{\square}{\square}$$

2. $\triangle GHI \sim \triangle KJL$



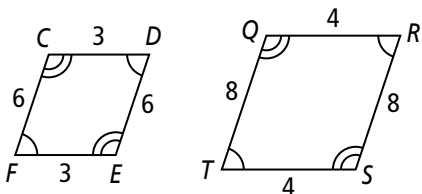
$$\angle G \cong \square \qquad \angle H \cong \square$$

$$\angle I \cong \square$$

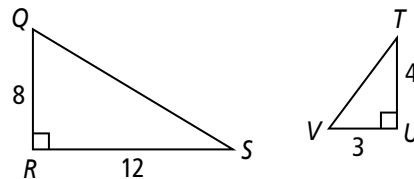
$$\frac{GH}{KJ} = \frac{\square}{\square} = \frac{\square}{\square}$$

Determine whether the polygons are similar. If so, write a similarity statement and give the scale factor. If not, explain.

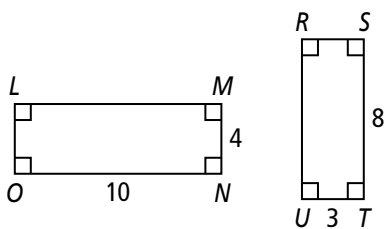
3.



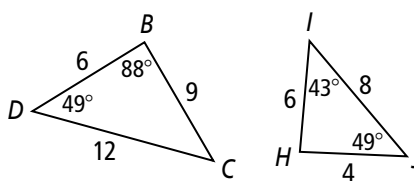
4.



5.

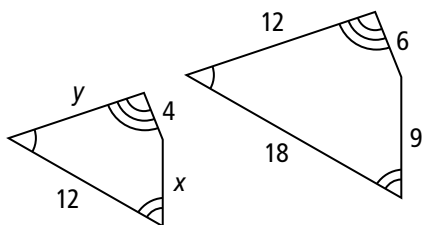


6.

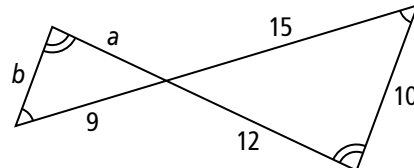


Algebra The polygons are similar. Find the value of each variable.

7.



8.



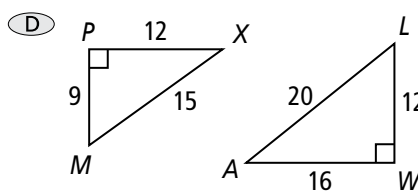
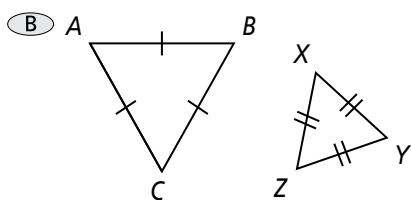
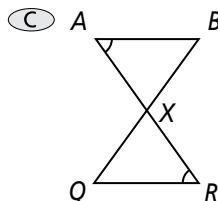
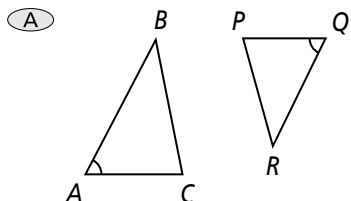
Standardized Test Prep

Proving Triangles Similar

Multiple Choice

For Exercises 1–3, choose the correct letter.

1. Which pair of triangles can be proven similar by the AA ~ Postulate?



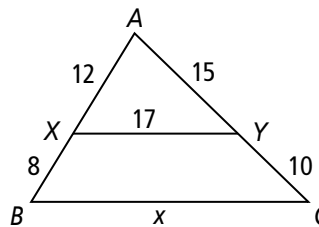
2. $\triangle AXY \sim \triangle ABC$. What is the value of x ?

(F) $10\frac{1}{5}$

(H) $11\frac{1}{3}$

(G) 19

(I) $28\frac{1}{3}$



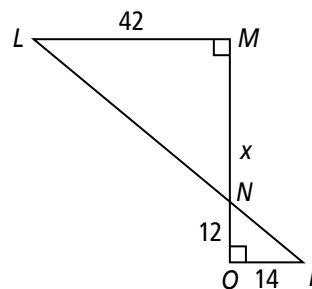
3. $\triangle LMN \sim \triangle PON$. What is the value of x ?

(A) 36

(C) 25

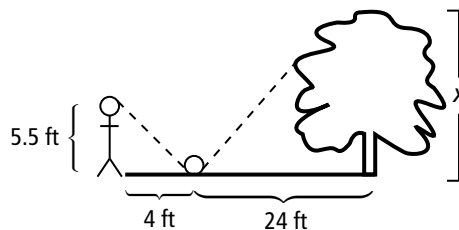
(B) 20

(D) $28\frac{1}{3}$



Short Response

4. Irene places a mirror on the ground 24 ft from the base of an oak tree. She walks backward until she can see the top of the tree in the middle of the mirror. At that point, Irene's eyes are 5.5 ft above the ground, and her feet are 4 ft from the mirror. How tall is the oak tree? Explain.



Practice (continued)

Form K

Proving Triangles Similar

8. A 1.6-m-tall woman stands next to the Eiffel Tower. At this time of day, her shadow is 0.5 m long. At the same time, the tower's shadow is 93.75 m long. How tall is the Eiffel Tower?

9. At 4:00 P.M. Karl stands next to his house and measures his shadow and the house's shadow. Karl's shadow is 8 ft long. The house's shadow is 48 ft long. If Karl is 6 ft tall, how tall is his house?

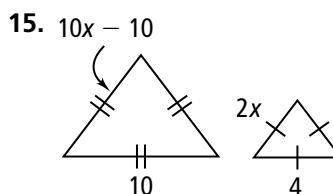
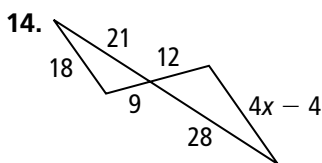
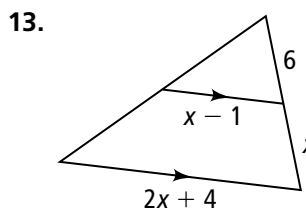
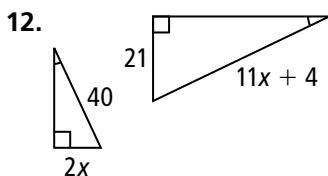
10. **Error Analysis** Jacob wants to use indirect measurement to find the height of his school. He knows the basketball pole next to the school is 13 ft high. He measures the length of the pole's shadow. At the same time of day, he measures the length of the school's shadow. Then he writes a proportion:

$$\frac{13 \text{ ft}}{\text{school height}} = \frac{\text{school shadow}}{\text{pole shadow}}$$

What error has Jacob made?

11. **Reasoning** Explain why there is an AA Similarity Postulate but not an AA Congruence Postulate.

Algebra Explain why the triangles are similar. Then find the value of x .



16. **Think About a Plan** A right triangle has legs 3 cm and 4 cm and a hypotenuse 5 cm. Another right triangle has a 12-cm leg. Find all the possible lengths of the second leg that would make the triangles similar. For each possible length, find the corresponding length of the hypotenuse.
 - To which measures must you compare the 12-cm leg?
 - How can you find the measure of the hypotenuse?

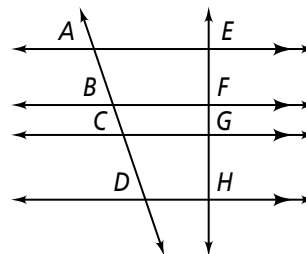
Standardized Test Prep

Proportions in Triangles

Multiple Choice

For Exercises 1–5, choose the correct letter.

For Exercises 1 and 2, use the diagram at the right.



1. Which makes the proportion true? $\frac{AB}{\square} = \frac{EF}{GH}$

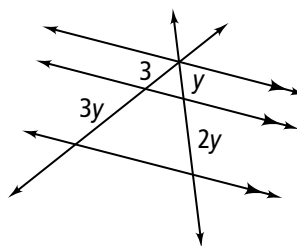
- (A) AD (C) CD
(B) DH (D) BC

2. Which proportion is *not* true?

- (F) $\frac{BC}{CD} = \frac{FG}{GH}$ (G) $\frac{AC}{CD} = \frac{EG}{GH}$ (H) $\frac{BD}{FH} = \frac{AD}{EH}$ (I) $\frac{AB}{AE} = \frac{EF}{BF}$

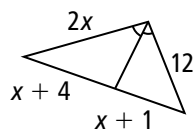
3. What is the value of y ?

- (A) 2 (C) 3
(B) 4 (D) 6



4. What is the value of x ?

- (F) 3 (H) 6
(G) 8 (I) 12



5. In $\triangle DEF$, the bisector of $\angle F$ divides the opposite sides into segments that are 4 and 9 in. long. The side of the triangle adjacent to the 4 in. segment is 6 in. long. To the nearest tenth of an inch, how long is the third side of the triangle?

- (A) 2.7 in. (B) 6 in. (C) 13 in. (D) 13.5 in.

Short Response

6. In $\triangle QRS$, $\overline{XY} \parallel \overline{SR}$. \overline{XY} divides \overline{QR} and \overline{QS} into segments as follows: $\overline{SX} = 3$, $\overline{XQ} = 2x$, $\overline{RY} = 4.5$, and $\overline{YQ} = 7.5$. Write a proportion to find x . What is the length of \overline{QS} ?

Practice

Form K

Proportions in Triangles

Use the figure at the right to complete each proportion.

1. $\frac{CF}{\square} = \frac{AC}{AI}$

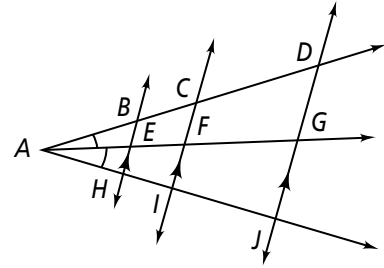
2. $\frac{AB}{BC} = \frac{\square}{HI}$

3. $\frac{\square}{IJ} = \frac{BC}{HI}$

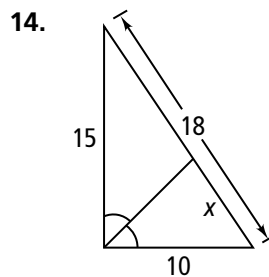
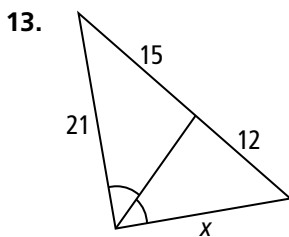
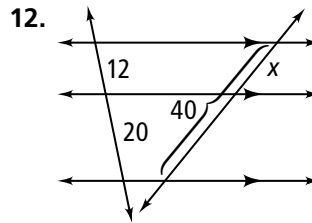
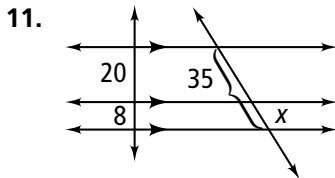
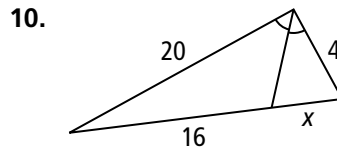
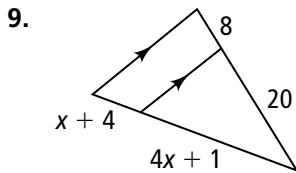
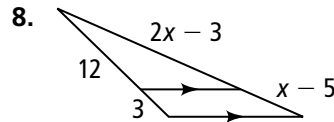
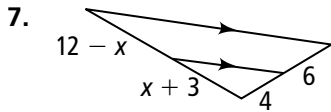
4. $\frac{JG}{\square} = \frac{GD}{AD}$

5. $\frac{FG}{EF} = \frac{CD}{\square}$

6. $\frac{AC}{AI} = \frac{\square}{IJ}$



Algebra Solve for x .



Standardized Test Prep

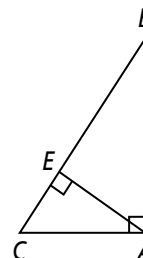
Similarity in Right Triangles

Multiple Choice

For Exercises 1–5, choose the correct letter.

1. Which segment of the hypotenuse is adjacent to \overline{AB} ?

- (A) \overline{EC} (B) \overline{AC} (C) \overline{AE} (D) \overline{BE}

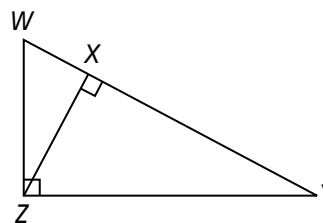


2. What is the geometric mean of 7 and 12?

- (F) $1\frac{5}{7}$ (G) 9.5 (H) $2\sqrt{21}$ (I) $4\sqrt{21}$

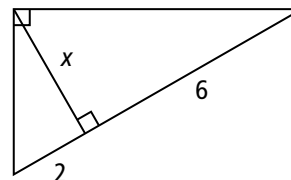
3. Which similarity statement is true?

- (A) $\triangle WYZ \sim \triangle XZW \sim \triangle XYZ$
 (B) $\triangle WYZ \sim \triangle WZX \sim \triangle ZYX$
 (C) $\triangle YZW \sim \triangle XZW \sim \triangle XZY$
 (D) $\triangle YZW \sim \triangle ZXW \sim \triangle ZYX$



4. What is the value of x ?

- (F) $2\sqrt{3}$ (H) 4
 (G) $4\sqrt{3}$ (I) 6

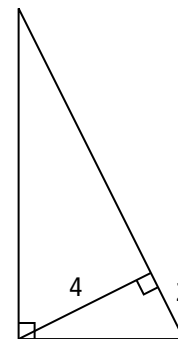


5. The altitude of the hypotenuse of a right triangle divides the hypotenuse into segments of lengths 14 and 8. What is the length of the altitude?

- (A) $2\sqrt{77}$ (B) $4\sqrt{7}$ (C) $4\sqrt{11}$ (D) 11

Extended Response

6. What is the perimeter of the large triangle shown at the right?
 Show your work.

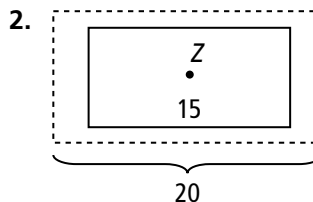
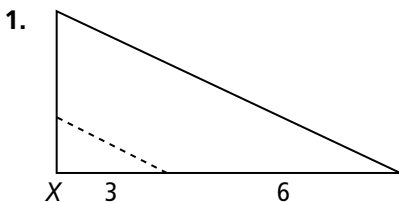


Standardized Test Prep

Dilations

Gridded Response

The solid-line figure is a dilation of the dashed-line figure. The labeled point is the center of dilation. Find the scale factor for each dilation. Use whole numbers or decimals. Enter your responses on the grid provided.



Solve the problem and enter your response on the grid provided.

- The image of an eraser in a magnifying glass is three times the eraser's actual size and has a width of 14.4 cm. What is the actual width in cm?
- A square on a transparency is 1.7 in. long. The square's image on the screen is 11.05 in. long. What is the scale factor of the dilation?
- A dilation maps $\triangle LMN$ to $\triangle L'M'N'$. $MN = 14$ in. and $M'N' = 9.8$ in. If $LN = 13$ in., what is $L'N'$?

Answers

1.

⊖	⊕	⊕	⊕	⊕	⊕
⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

2.

⊖	⊕	⊕	⊕	⊕	⊕
⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

3.

⊖	⊕	⊕	⊕	⊕	⊕
⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

4.

⊖	⊕	⊕	⊕	⊕	⊕
⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

5.

⊖	⊕	⊕	⊕	⊕	⊕
⊙	⊙	⊙	⊙	⊙	⊙
0	0	0	0	0	0
1	1	1	1	1	1
2	2	2	2	2	2
3	3	3	3	3	3
4	4	4	4	4	4
5	5	5	5	5	5
6	6	6	6	6	6
7	7	7	7	7	7
8	8	8	8	8	8
9	9	9	9	9	9

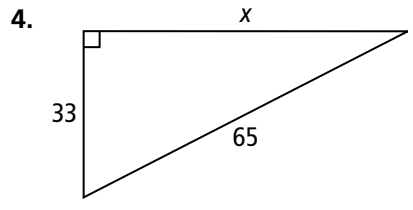
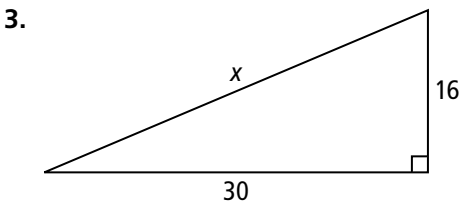
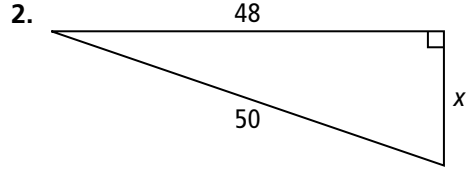
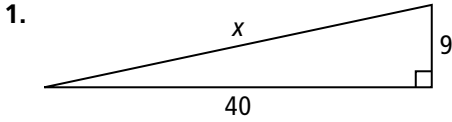
Standardized Test Prep

The Pythagorean Theorem and Its Converse

Gridded Response

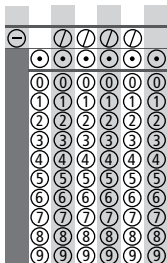
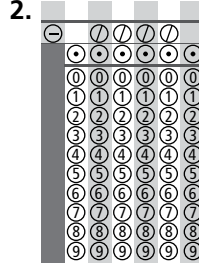
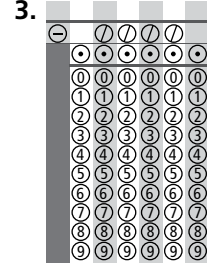
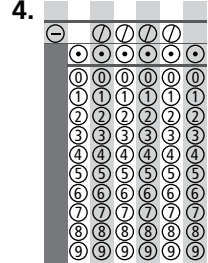
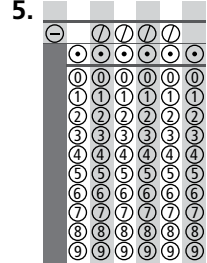
Solve each exercise and enter your answer on the grid provided.

What is the value of x ?



5. An acute triangle has sides that are 14 mm and 97 mm long, respectively. The third side of the triangle must be greater than what whole number of millimeters?

Answers

1.  2.  3.  4.  5. 

Standardized Test Prep

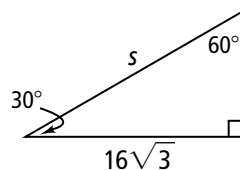
Special Right Triangles

Multiple Choice

For Exercises 1–5, choose the correct letter.

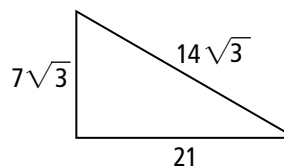
1. What is the value of s ?

- (A) 8 (C) $16\sqrt{2}$
 (B) 16 (D) 32



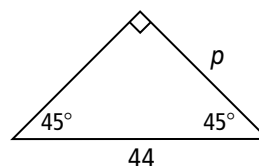
2. What are the angle measures of the triangle?

- (F) 30° , 60° , and 90° (H) 60° , 60° , and 60°
 (G) 45° , 45° , and 90° (I) They cannot be determined.



3. What is the value of p ?

- (A) 22 (C) 44
 (B) $22\sqrt{2}$ (D) $44\sqrt{3}$



4. In the center of town there is a square park with side length 30 ft. If a person walks from one corner of the park to the opposite corner, how far does the person walk? Round to the nearest foot.

- (F) 21 ft (G) 42 ft (H) 52 ft (I) 60 ft

5. An equilateral triangle has an altitude of 15 m. What is the perimeter of the triangle?

- (A) $30\sqrt{2}$ m (B) 45 m (C) $30\sqrt{3}$ m (D) $60\sqrt{3}$ m

Short Response

6. The hypotenuse of a 30° - 60° - 90° triangle is 24.2 ft. Explain how to find the lengths of the legs of the triangle.

Standardized Test Prep

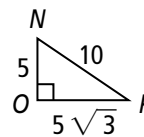
Trigonometry

Multiple Choice

For Exercises 1–6, choose the correct letter.

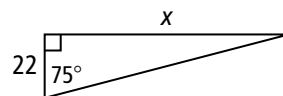
1. What is the value of $\sin N$?

- (A) $\frac{1}{2}$ (C) $\frac{\sqrt{3}}{2}$
 (B) $\frac{\sqrt{3}}{3}$ (D) $\sqrt{3}$



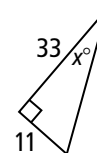
2. What is the value of x to the nearest tenth?

- (F) 5.7 (H) 30.3
 (G) 21.2 (I) 82.1



3. What is the value of x to the nearest degree?

- (A) 18 (C) 71
 (B) 19 (D) 72

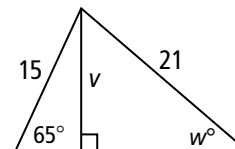


4. A 14-ft-long ramp rises at an angle of 22.2° . How long is the base of the ramp to the nearest foot?

- (F) 11 ft (G) 13 ft (H) 17 ft (I) 22 ft

5. What is the value of w to the nearest degree?

- (A) 25 (C) 40
 (B) 35 (D) 45



6. A right triangle has an angle that measures 34° and the adjacent side measures 17. What is the length of the hypotenuse to the nearest tenth?

- (F) 20.5 (G) 25.2 (H) 30.4 (I) 34

Short Response

7. A 12-ft-long ladder is leaning against a wall and makes an 80° angle with the ground. How high up the wall does the ladder reach, and how far is the base of the ladder from the base of the wall? Round to the nearest inch.

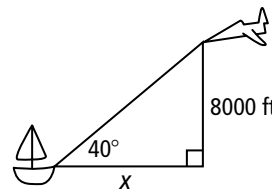
Standardized Test Prep

Angles of Elevation and Depression

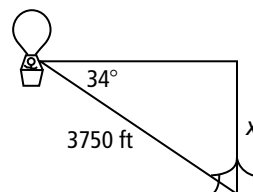
Multiple Choice

For Exercises 1–5, choose the correct letter.

- A person can see the top of a building at an angle of 65° . The person is standing 50 ft away from the building and has an eye level of 5 ft. How tall is the building to the nearest tenth of a foot?
 (A) 26.1 ft (B) 50.3 ft (C) 107.2 ft (D) 112.2 ft
- A fire ranger on a 150-ft-tall tower spots a fire at a 30° angle of depression. How many feet away from the tower is the fire to the nearest tenth?
 (F) 86.6 ft (G) 129.9 ft (H) 259.8 ft (I) 300 ft
- What is the value of x to the nearest foot?
 (A) 6713 ft (C) 10,443 ft
 (B) 9534 ft (D) 12,445 ft



- What is the value of x to the nearest foot?
 (F) 2097 ft (H) 3108 ft
 (G) 2529 ft (I) 6706 ft



- A wildlife biologist looks up at a 78° angle of elevation to see a flock of geese in the air. The biologist is standing 200 ft away from a place directly underneath the geese. How high are the geese flying, to the nearest tenth of a foot?
 (A) 195.6 ft (B) 204.5 ft (C) 940.9 ft (D) 961.9 ft

Extended Response

- Two buildings stand 90 ft apart at their closest points. At those points, the angle of depression from the top of the taller building to the top of the shorter building is 12° . How much taller is the taller building? Draw a diagram to support your answer. Round your answer to the nearest foot. Explain.