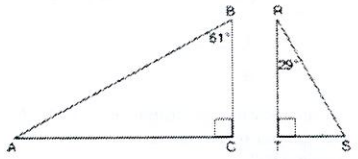
Name: _____ Date: _____

The ratio of similarity of $\triangle BOY$ to $\triangle GRL$ is 1:2. If $BO = x + 3$ and $GR = 3x - 1$, then the length of $\overline{GR}$ is

1) 5
2) 7
3) 10
4) 20

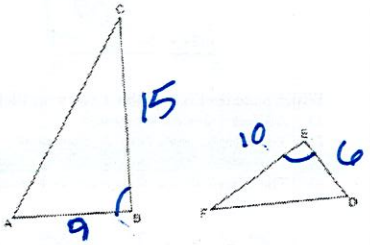
Given right triangle ABC with a right angle at C, $m\angle B = 61°$. Given right triangle RST with a right angle at T, $m\angle R = 29°$.



Which proportion in relation to $\triangle ABC$ and $\triangle RST$ is *not* correct?

1) $\frac{AB}{RS} = \frac{RT}{AC}$
2) $\frac{BC}{ST} = \frac{AB}{RS}$
3) $\frac{BC}{ST} = \frac{AC}{RT}$
4) $\frac{AB}{AC} = \frac{RS}{RT}$

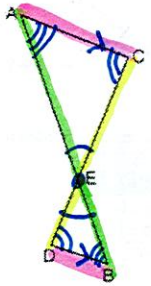
Triangles ABC and DEF are drawn below.



If $AB = 9$, $BC = 15$, $DE = 6$, $EF = 10$, and $\angle B \cong \angle E$, which statement is true?

1) $\angle CAB \cong \angle DEF$
2) $\frac{AB}{CB} = \frac{FE}{DE}$
3) $\triangle ABC \sim \triangle DEF$
4) $\frac{AB}{DE} = \frac{FE}{CB}$

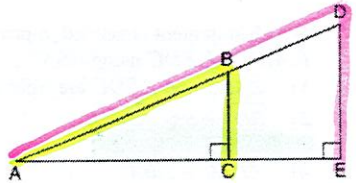
As shown in the diagram below, $\overline{AB}$ and $\overline{CD}$ intersect at E, and $\overline{AC} \parallel \overline{BD}$.



Given $\triangle AEC \sim \triangle BED$, which equation is true?

1) $\frac{CE}{BE} = \frac{CA}{BD}$
2) $\frac{AE}{BE} = \frac{AC}{BD}$
3) $\frac{EC}{AE} = \frac{BE}{ED}$
4) $\frac{ED}{EC} = \frac{AC}{BD}$

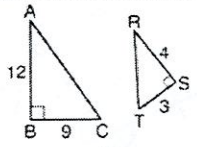
In the diagram below of right triangle AED, $\overline{BC} \parallel \overline{DE}$.

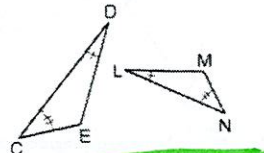


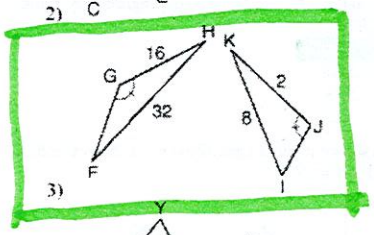
Which statement is always true?

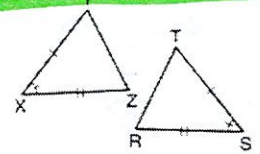
1) $\frac{AC}{BC} = \frac{DE}{AE}$
2) $\frac{AB}{AD} = \frac{BC}{DE}$
3) $\frac{AC}{CE} = \frac{BC}{DE}$
4) $\frac{DE}{BC} = \frac{DB}{AB}$

Using the information given below, which set of triangles can *not* be proven similar?

1)


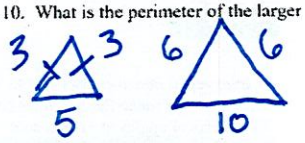
2)


3)


4)


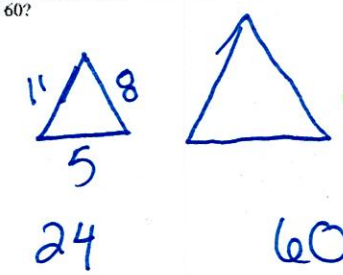
The base of an isosceles triangle is 5 and its perimeter is 11. The base of a similar isosceles triangle is 10. What is the perimeter of the larger triangle?

1) 15
2) 21
3) 22
4) 110

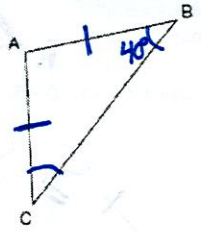


Triangle ABC is similar to triangle DEF. The lengths of the sides of $\triangle ABC$ are 5, 8, and 11. What is the length of the shortest side of $\triangle DEF$ if its perimeter is 60?

1) 10
2) 12.5
3) 20
4) 27.5



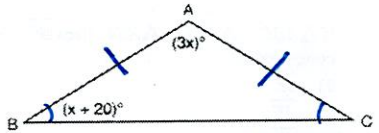
In the diagram of $\triangle ABC$ below, $\overline{AB} \cong \overline{AC}$. The measure of $\angle B$ is 40°.



What is the measure of $\angle A$?

1) 40°
2) 50°
3) 70°
4) 100°

In the diagram below of $\triangle ABC$, $\overline{AB} \cong \overline{AC}$, $m\angle A = 3x$, and $m\angle B = x + 20$.

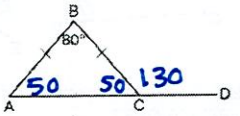


What is the value of x?

1) 10
2) 28
3) 32
4) 40

$180 = x + 20 + x + 20 + 3x$
$180 = 5x + 40$
$140 = 5x$

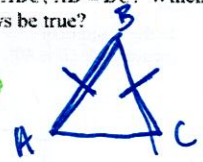
In the diagram below of isosceles $\triangle ABC$, the measure of vertex angle B is 80°. If $\overline{AC}$ extends to point D, what is $m\angle BCD$?



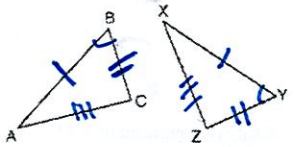
1) 50
2) 80
3) 100
4) 130

In isosceles triangle ABC, $AB = BC$. Which statement will always be true?

1) $m\angle B = m\angle A$
2) $m\angle A > m\angle B$
3) $m\angle A = m\angle C$
4) $m\angle C < m\angle B$



In the diagram below, $\triangle ABC \cong \triangle XYZ$.



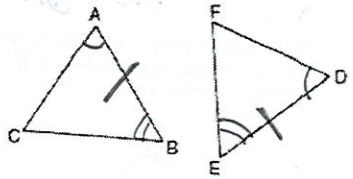
Which two statements identify corresponding congruent parts for these triangles?

1) $\overline{AB} \cong \overline{XY}$ and $\angle C \cong \angle Y$
2) $\overline{AB} \cong \overline{YZ}$ and $\angle C \cong \angle X$
3) $\overline{BC} \cong \overline{XY}$ and $\angle A \cong \angle Y$
4) $\overline{BC} \cong \overline{YZ}$ and $\angle A \cong \angle X$

If $\triangle ABC \cong \triangle JKL \cong \triangle RST$, then $\overline{BC}$ must be congruent to

1) $\overline{JL}$
2) $\overline{JK}$
3) $\overline{ST}$
4) $\overline{RS}$

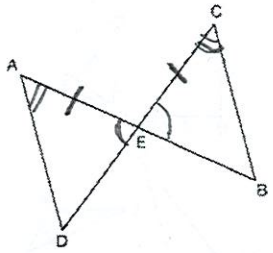
In the diagram of $\triangle ABC$ and $\triangle DEF$ below, $\overline{AB} \cong \overline{DE}$, $\angle A \cong \angle D$, and $\angle B \cong \angle E$.



Which method can be used to prove $\triangle ABC \cong \triangle DEF$?

1) SSS
2) SAS
3) ASA
4) HL

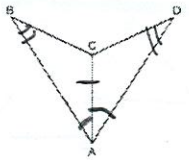
In the diagram below of $\triangle DAE$ and $\triangle BCE$, $\overline{AB}$ and $\overline{CD}$ intersect at E, such that $\overline{AE} \cong \overline{CE}$ and $\angle BCE \cong \angle DAE$.



Triangle DAE can be proved congruent to triangle BCE by

1) ASA
2) SAS
3) SSS
4) HL

As shown in the diagram below, $\overline{AC}$ bisects $\angle BAD$ and $\angle B \cong \angle D$.



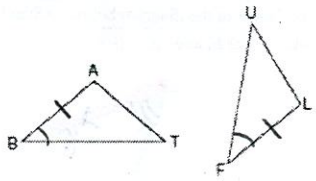
Which method could be used to prove $\triangle ABC \cong \triangle ADC$?

1) SSS
2) AAA
3) SAS
4) AAS

A transversal intersects two lines. Which condition would always make the two lines parallel?

1) Vertical angles are congruent.
2) Alternate interior angles are congruent.
3) Corresponding angles are supplementary.
4) Same-side interior angles are complementary.

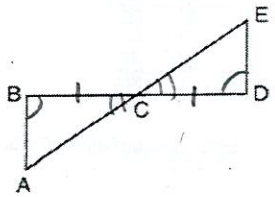
In the accompanying diagram of triangles BAT and FLU, $\angle B \cong \angle F$ and $\overline{BA} \cong \overline{FL}$.



Which statement is needed to prove $\triangle BAT \cong \triangle FLU$?

1) $\angle A \cong \angle L$
2) $\overline{AT} \cong \overline{LU}$
3) $\angle A \cong \angle U$
4) $\overline{BA} \parallel \overline{FL}$

Given: $\overline{AE}$ bisects $\overline{BD}$ at C
$\overline{AB}$ and $\overline{DE}$ are drawn
$\angle ABC \cong \angle EDC$



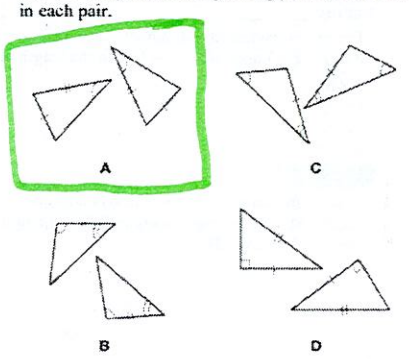
Which statement is needed to prove $\triangle ABC \cong \triangle EDC$ using ASA?

1) $\angle ABC$ and $\angle EDC$ are right angles.
2) $\overline{BD}$ bisects $\overline{AE}$ at C.
3) $\angle BCA \cong \angle DCE$
4) $\angle DEC \cong \angle BAC$

Which statement about parallelograms is always true?

1) The diagonals are congruent.
2) The diagonals bisect each other.
3) The diagonals are perpendicular.
4) The diagonals bisect their respective angles.

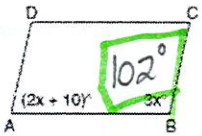
In the diagram below, four pairs of triangles are shown. Congruent corresponding parts are labeled in each pair.



Using only the information given in the diagrams, which pair of triangles can *not* be proven congruent?

1) A
2) B
3) C
4) D

In the accompanying diagram of parallelogram $ABCD$, $m\angle A = (2x + 10)$ and $m\angle B = 3x$. Find the number of degrees in $m\angle B$.



Which statement is true about every parallelogram?

1) All four sides are congruent.
2) The interior angles are all congruent.
3) Two pairs of opposite sides are congruent.
4) The diagonals are perpendicular to each other.

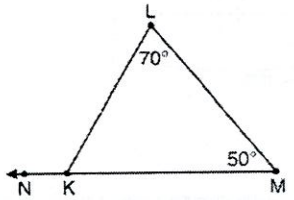
$2x + 10 + 3x = 180$

$5x + 10 = 180$

$5x = 170$

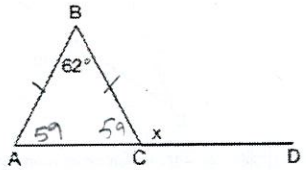
$x = 34$

In the diagram of $\triangle KLM$ below, $m\angle L = 70$, $m\angle M = 50$, and $\overline{MK}$ is extended through N.



What is the measure of $\angle LKN$?
1) 60°
2) 120°
3) 180°
4) 300°

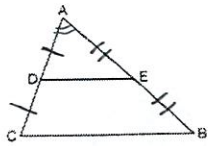
Given $\triangle ABC$ with $m\angle B = 62°$ and side $\overline{AC}$ extended to D, as shown below.



Which value of x makes $\overline{AB} \cong \overline{CB}$?
1) 59°
2) 62°
3) 118°
4) 121°

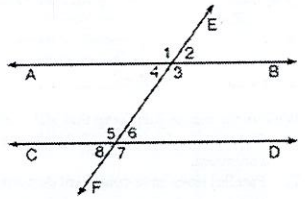
A line segment is dilated by a scale factor of 2 centered at a point not on the line segment. Which statement regarding the relationship between the given line segment and its image is true?
1) The line segments are perpendicular, and the image is one-half of the length of the given line segment.
2) The line segments are perpendicular, and the image is twice the length of the given line segment.
3) The line segments are parallel, and the image is twice the length of the given line segment.
4) The line segments are parallel, and the image is one-half of the length of the given line segment.

Triangle ABC is shown in the diagram below.



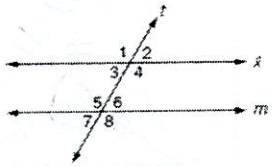
If $\overline{DE}$ joins the midpoints of $\overline{ADC}$ and $\overline{AEB}$, which statement is not true?
1) $DE = \frac{1}{2}CB$
2) $\overline{DE} \parallel \overline{CB}$
3) $\frac{AD}{DC} = \frac{DE}{CB}$
4) $\triangle ABC \sim \triangle AED$

Transversal $\overleftrightarrow{EF}$ intersects $\overleftrightarrow{AB}$ and $\overleftrightarrow{CD}$, as shown in the diagram below.

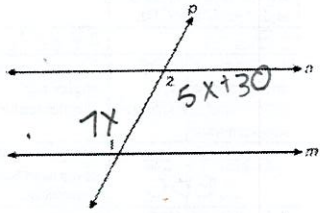


Which statement could always be used to prove $\overleftrightarrow{AB} \parallel \overleftrightarrow{CD}$?
1) $\angle 2 \cong \angle 4$
2) $\angle 7 \cong \angle 8$
3) $\angle 3$ and $\angle 6$ are supplementary
4) $\angle 1$ and $\angle 5$ are supplementary

In the accompanying diagram, line t is parallel to line m, and line r is a transversal.



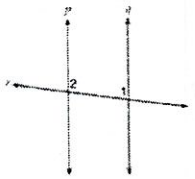
Which must be a true statement?
1) $m\angle 1 + m\angle 4 = 180$
2) $m\angle 1 + m\angle 8 = 180$
3) $m\angle 3 + m\angle 6 = 180$
4) $m\angle 2 + m\angle 5 = 180$



If $m\angle 1 = 7x$ and $m\angle 2 = 5x + 30$, lines m and n are parallel when x equals
1) 12.5
2) 15
3) 87.5
4) 105

$7x = 5x + 30$

Lines p and q are intersected by line r, as shown below.



If $m\angle 1 = 7x - 36$ and $m\angle 2 = 5x + 12$, for which value of x would $p \parallel q$?
1) 17
2) 24
3) 83
4) 97

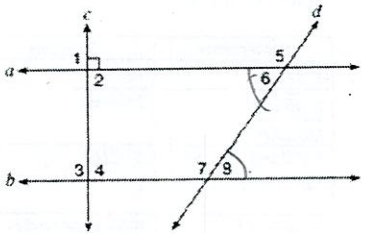
$7x - 36 + 5x + 12 = 180$
$12x - 24 = 180$
$12x = 204$

In the accompanying diagram, line a intersects line b.

What is the value of x?
1) −10
2) 5
3) 10
4) 90

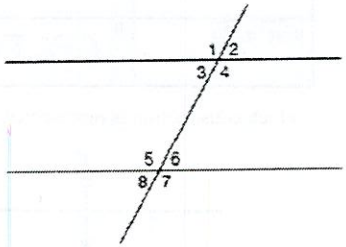
$x + 5 = 2x - 5$
$10 = x$

In the accompanying diagram, lines a and b are parallel, and lines c and d are transversals.



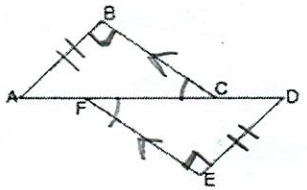
Which angle is congruent to angle 8?
1) 6
2) 5
3) 3
4) 4

In the accompanying figure, what is one pair of alternate interior angles?



1) $\angle 1$ and $\angle 2$
2) $\angle 4$ and $\angle 5$
3) $\angle 4$ and $\angle 6$
4) $\angle 6$ and $\angle 8$

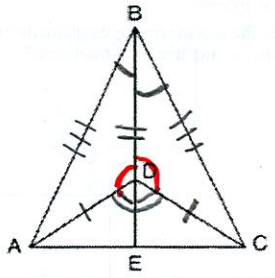
Complete the partial proof below for the accompanying diagram by providing reasons for steps 3, 6, 8, and 9.



Given: $\overline{AFCD}$, $\overline{AB} \perp \overline{BC}$, $\overline{DE} \perp \overline{EF}$, $\overline{BC} \parallel \overline{FE}$, $\overline{AB} \cong \overline{DE}$

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

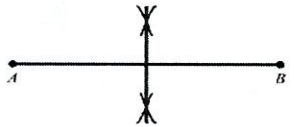
Statements	Reasons
1 $AFCD$	1 Given
2 $\overline{AB} \perp \overline{BC}$, $\overline{DE} \perp \overline{EF}$	2 Given
3 $\angle B$ and $\angle E$ are right angles.	3 Def of perp lines
4 $\angle B \cong \angle E$	4 All right angles are congruent.
5 $\overline{BC} \parallel \overline{FE}$	5 Given
6 $\angle BCA \cong \angle EFD$	6 Alt. interior $\angle$s $\cong$
7 $\overline{AB} \cong \overline{DE}$	7 Given
8 $\triangle ABC \cong \triangle DEF$	8 AAS
9 $\overline{AC} \cong \overline{FD}$	9 CPCTC



Fill in the missing statement and reasons below.

Statements	Reasons
1 $\triangle ABC$, $\overline{AEC}$, $\overline{BDE}$ with $\angle ABE \cong \angle CBE$, and $\angle ADE \cong \angle CDE$	1 Given
2 $\overline{BD} \cong \overline{BD}$	2 Reflexive
3 $\angle BDA$ and $\angle ADE$ are supplementary. $\angle BDC$ and $\angle CDE$ are supplementary.	3 Linear pairs of angles are supplementary.
4 $\angle BDA \cong \angle BDC$	4 Supplements of congruent angles are congruent.
5 $\triangle ABD \cong \triangle CBD$	5 ASA
6 $\overline{AD} \cong \overline{CD}$, $\overline{AB} \cong \overline{CB}$	6 CPCTC
7 $\overline{BDE}$ is the perpendicular bisector of $\overline{AC}$.	7

Which construction is represented by the diagram below?

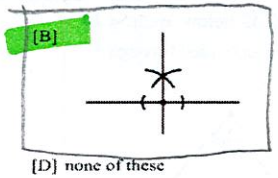


[A] copying $\overline{AB}$ [B] bisecting $\overline{AB}$ [C] rotating $\overline{AB}$ [D] drawing a line parallel to $\overline{AB}$

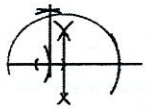
Which figure best represents the construction of a segment perpendicular to a given segment through a given point?

[A]

[B]

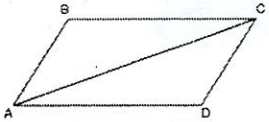


[C]



[D] none of these

Given that $ABCD$ is a parallelogram, a student wrote the proof below to show that a pair of its opposite angles are congruent.

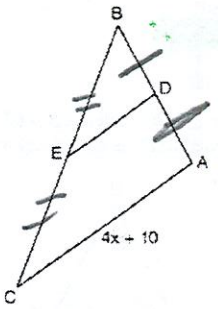


Statement	Reason
1. ABCD is a parallelogram.	1. Given
2. $\overline{BC} \cong \overline{AD}$, $\overline{AB} \cong \overline{DC}$	2. Opposite sides of a parallelogram are congruent.
3. $\overline{AC} \cong \overline{CA}$	3. Reflexive Postulate of Congruency
4. $\triangle ABC \cong \triangle CDA$	4. Side-Side-Side
5. $\angle B \cong \angle D$	5 _____

What is the reason justifying that $\angle B \cong \angle D$?

1) Opposite angles in a quadrilateral are congruent.
2) Parallel lines have congruent corresponding angles.
3) Corresponding parts of congruent triangles are congruent.
4) Alternate interior angles in congruent triangles are congruent.

In the diagram below of $\triangle ABC$, D is the midpoint of $\overline{AB}$, and E is the midpoint of $\overline{BC}$.



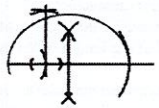
If $AC = 4x + 10$, which expression represents DE?

1) $x + 2.5$
2) $2x + 5$
3) $2x + 10$
4) $8x + 20$

Which figure best represents the construction of a line segment congruent to a given segment?

[A] none of these

[B]



[C]

[D]