

Read the directions below carefully.

**BEFORE THE TEST...**

- Take 10 minutes to review your notes.
- Get a calculator and blank sheets of paper for your calculations.

**KEEP IN MIND...**

- There are 30 questions on the test.
- You may use a calculator throughout the exam.
- Write your answers clearly in the space given. Do your work on separate paper.
- There is no time limit, but you must complete the test in ONE sitting.
- Do NOT look at the other pages of the workbook while taking the exam. Consider carefully cutting the pages of the exam out of the workbook and removing the workbook from your desk.

**AFTER THE TEST...**

- Grade yourself and record your score on your grading sheets.



When you are ready,  
begin the test.

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1. Select all statements that are true.
- A) Rays  $\overrightarrow{AB}$  and  $\overrightarrow{BA}$  are the same rays.
  - B) Collinear points are coplanar.
  - C) Two points determine a plane.
  - D) Vertical angles are never adjacent.
  - E) The supplement of an acute angle is acute.
  - F) A triangle cannot have more than one obtuse angle.

2. Which transformation does not preserve the orientation of a figure? Select all that apply.

- A) translation
- B) reflection
- C) rotation
- D) dilation

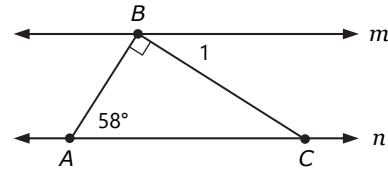
3. Which property justifies the first step in solving  $5x - 4 = 11$ ?

- A) Addition Property of Equality
- B) Subtraction Property of Equality
- C) Multiplication Property of Equality
- D) Division Property of Equality

4. Points  $A$ ,  $B$ , and  $P$  are collinear with  $P$  between  $A$  and  $B$ . Find  $AP$  and  $PB$  if  $AB = 18$ ,  $AP = 2x$ , and  $PB = 3x - 2$ .

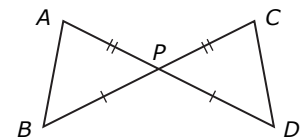
5. A triangle has angles measuring  $x^\circ$ ,  $2x^\circ$ , and  $3x^\circ$ . Classify the triangle as *acute*, *right*, or *obtuse*.

6. Find the measure of  $\angle 1$  if  $m \parallel n$ .



7. Which congruence criterion can be used most directly to prove  $\triangle APB \cong \triangle CPD$ ?

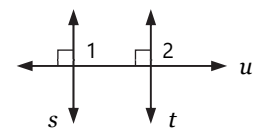
- A) SSS
- B) SAS
- C) ASA
- D) AAS



8. Complete the proof that, if two lines are perpendicular to the same line, then the lines are parallel to each other. Give reasons for Steps 3 and 4.

Given:  $s \perp u$ ,  $t \perp u$

Prove:  $s \parallel t$



STATEMENTS	REASONS
1. $s \perp u$ , $t \perp u$	1. Given
2. $\angle 1$ and $\angle 2$ are right angles.	2. Definition of perpendicular lines
3. $\angle 1 \cong \angle 2$	3.
4. $s \parallel t$	4.

9. Which transformation produces a different image of  $(1, 1)$ ?
- A) a translation of  $(x, y) \rightarrow (x, y - 2)$   
 B) a reflection over the line  $y = -x$   
 C) a rotation of  $180^\circ$  counterclockwise about the origin  
 D) a dilation about the origin by a scale factor of  $-1$

10. If  $n^2$  is even, then  $n$  is even.

Write the first step to prove this statement using indirect proof.

11. What is the sum of the measures of the interior angles of a hexagon?

12. Which lengths cannot form a triangle?

- A) 2, 4, 8                      B) 4, 5, 6  
 C) 3, 6, 7                      D) 5, 5, 8

13. Which statement cannot be used to prove  $\triangle ABC \sim \triangle DEF$ ?

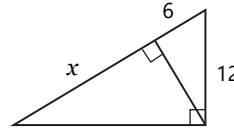
- A)  $\angle A \cong \angle D$  and  $\angle B \cong \angle E$

B)  $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$

C)  $\frac{AB}{DE} = \frac{AC}{DF}$  and  $\angle A \cong \angle D$

D)  $\frac{AB}{DE} = \frac{BC}{EF}$  and  $\angle C \cong \angle F$

14. Find the value of  $x$ .

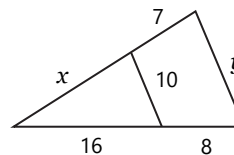


15. Which statement is not true?

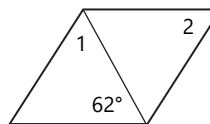
A)  $\sin 30^\circ = \frac{1}{2}$                       B)  $\tan 45^\circ = 1$

C)  $\tan 60^\circ = \frac{\sqrt{3}}{3}$                       D)  $\cos 45^\circ = \frac{\sqrt{2}}{2}$

16. Find the values of  $x$  and  $y$  that make the triangles similar.

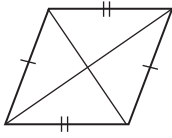


17. Find the measures of  $\angle 1$  and  $\angle 2$  if the quadrilateral is a rhombus.



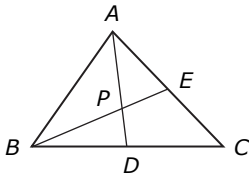
18. Two consecutive angles in a parallelogram are in the ratio 4:5. What are the measures of the four angles of the parallelogram?

19. Which additional information would prove that this quadrilateral is a rhombus?

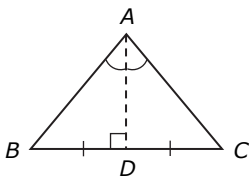


- A) The opposite sides are parallel.  
 B) The opposite angles are congruent.  
 C) The diagonals are congruent.  
 D) The diagonals are perpendicular.

20. In  $\triangle ABC$ ,  $P$  is the centroid. Find the  $AD$  if  $AP = 3x - 4$  and  $PD = x$ .

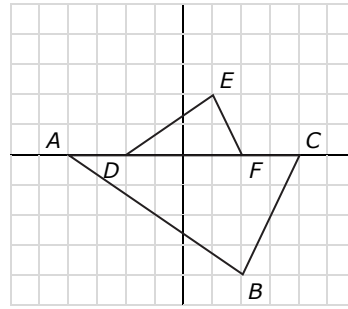


21. What type of segment is  $\overline{AD}$ ? Select all that apply.



- A) midsegment  
 B) perpendicular bisector  
 C) angle bisector  
 D) median  
 E) altitude

22. Which two transformations map  $\triangle ABC$  onto  $\triangle DEF$ ? Assume that the center of dilation is the origin.

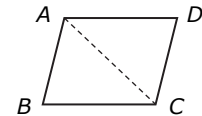


- A) a reflection over the  $x$ -axis and a dilation by a scale factor of 2  
 B) a reflection over the  $x$ -axis and a dilation by a scale factor of 0.5  
 C) a reflection over the  $y$ -axis and a dilation by a scale factor of 2  
 D) a reflection over the  $y$ -axis and a dilation by a scale factor of 0.5

23. Complete the proof that opposite angles of a parallelogram are congruent. Give reasons for Steps 3 through 5.

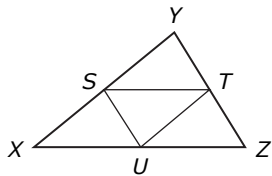
Given:  $\square ABCD$

Prove:  $\angle B \cong \angle D$

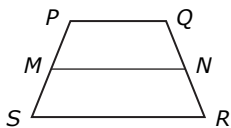


STATEMENTS	REASONS
1. $\square ABCD$	1. Given
2. $\overline{AB} \parallel \overline{DC}$ , $\overline{AD} \parallel \overline{BC}$	2. Definition of parallelogram
3. $\angle BAC \cong \angle DCA$ , $\angle BCA \cong \angle DAC$	3.
4. $\overline{AC} \cong \overline{CA}$	4.
5. $\triangle ABC \cong \triangle CDA$	5.
6. $\angle B \cong \angle D$	6. CPCTC

24.  $\overline{ST}$ ,  $\overline{TU}$ , and  $\overline{US}$  are midsegments of  $\triangle XYZ$ . Find the perimeter of  $\triangle STU$  if  $XY = 26$ ,  $YZ = 24$ , and  $XZ = 30$ .

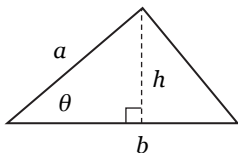


25.  $\overline{MN}$  is the midsegment of trapezoid  $PQRS$ . Find  $SR$  if  $PQ = 5$  and  $MN = 7$ .



26. In  $\triangle XYZ$ ,  $m\angle X = 55^\circ$  and  $m\angle Y = 65^\circ$ . List the sides from shortest to longest.

27. Which expressions give the height  $h$  and the area  $A$  of the triangle?

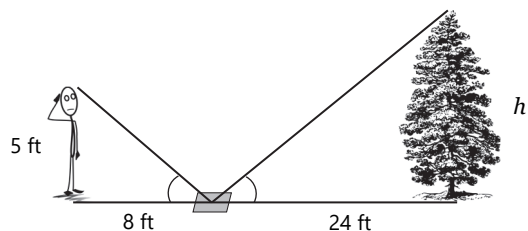


- A)  $h = a \sin \theta$ ,  $A = ab \sin \theta$   
 B)  $h = a \cos \theta$ ,  $A = ab \cos \theta$   
 C)  $h = a \sin \theta$ ,  $A = \frac{1}{2} ab \sin \theta$   
 D)  $h = a \cos \theta$ ,  $A = \frac{1}{2} ab \cos \theta$

28. A triangle has side lengths 7, 8, and 11. Classify the triangle as *acute*, *right*, or *obtuse*.

29. A 20-ft ladder leans against a wall. The angle of elevation of the ladder is  $50^\circ$ . How high up on the wall will the top of the ladder reach? Round your answer to the nearest tenth.

30. To estimate the height of a tree, Abigail places a mirror on the ground 24 ft from the tree and walks away until she sees the top of the tree in the mirror. Abigail is 5 ft tall and stands 8 ft away from the mirror. How tall is the tree?



**STOP**

This is the end of the test.  
 Review your answers before grading.