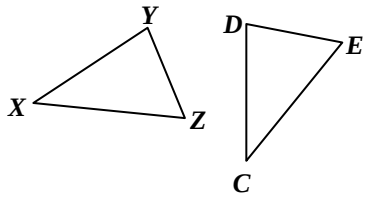
Polygons, Congruence, Similarity

Long-Term Memory Review – Grade 8

Review 1

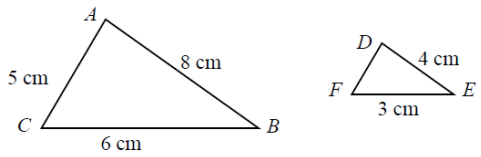
1. In the diagram below, ΔXYZ is congruent to ΔCDE $(\Delta XYZ \cong \Delta CDE)$.



Complete the following statements:

a) $\angle C \cong$ _____ b) $\overline{XZ} \cong$ _____ c) $\angle CDE \cong$ _____ d) $\overline{YZ} \cong$ _____ e) $\angle Z \cong$ _____ f) $\overline{DC} \cong$ _____

2. In the diagram below, ΔABC is similar to ΔDEF $(\Delta ABC \sim \Delta DEF)$. Find the length of $\overline{DF}$.



3. Below each name, sketch the following quadrilaterals. Label any important parts of each shape.

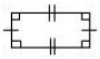
Parallelogram Trapezoid Rectangle Rhombus Square

4. Below each name, identify the sum of the interior angles for the following polygons. Explain how you arrived at your answers.

Quadrilateral Triangle Pentagon Hexagon

5. Identify all the quadrilaterals that have 2 pairs of parallel sides.

6. Which of these irregular polygons can be classified as a parallelogram?

a)  b)  c)  d) 

7. Identify the number of sides of each of the following polygons.

a) hexagon _____ b) pentagon _____ c) octagon _____ d) triangle _____

e) decagon _____ f) quadrilateral _____ g) nonagon _____ h) heptagon _____

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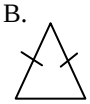
Review 2

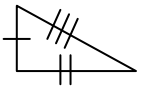
1. Given $\Delta ABC \cong \Delta DEF$, write 6 different congruency statements about the two triangles.

2. Explain what a *regular* polygon is. Draw 2 different examples of regular polygons.

3. Identify which of the following polygons is classified as an isosceles triangle.

A. 

B. 

C. 

D. none of these

E. choices A and B

F. choices B and C

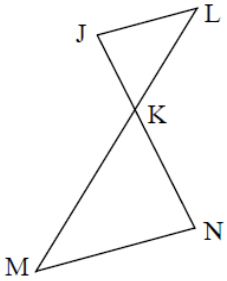
4. Sketch an acute scalene triangle.

5. Can a triangle have a right angle and an obtuse angle? Why or why not?

6. In the figure, $\Delta JKL \sim \Delta NKM$. Identify the 3 pair of corresponding sides and the 3 pair of congruent angles.

_____ _____ _____

_____ _____ _____



7. True or False? If false, give a counterexample to justify your answer.

   a) If two triangles are similar, then they are congruent.

   b) If two triangles are congruent, then they are similar.

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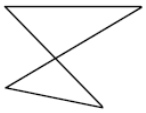
Review 3

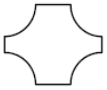
1. Using the formula $S=(n-2)180$, find the sum for the interior angles of an octagon and a hexagon.

2. Can a right triangle have 2 right angles? Why or why not?

3. For each of the shapes below, state whether they meet the definition of a polygon. Explain your reasoning.

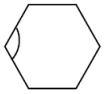
a) 

b) 

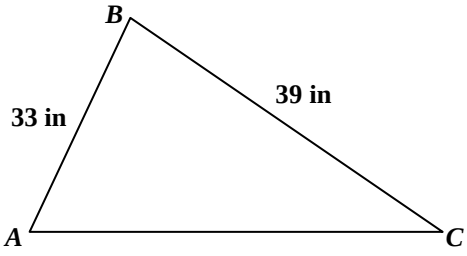
c) 

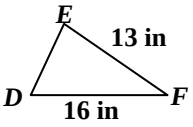
4. Sketch an isosceles trapezoid. Label the important parts.

5. The figure shown is a regular hexagon. What is the measure of one of the interior angles? Show your work.

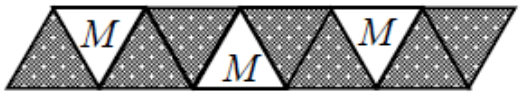


6. In the diagram, $\Delta ABC \sim \Delta DEF$. Find the lengths of $\overline{AC}$ and $\overline{DE}$.





7. Mark is repairing a block wall with triangular concrete blocks. What is the sum of the interior angles of the 3 missing blocks marked with an *M* below?



A. 180° B. 270° C. 360° D. 540°

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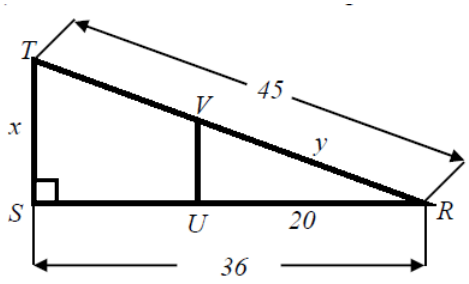
Review 4

1. Can an obtuse triangle have more than one obtuse angle? Explain why or why not.

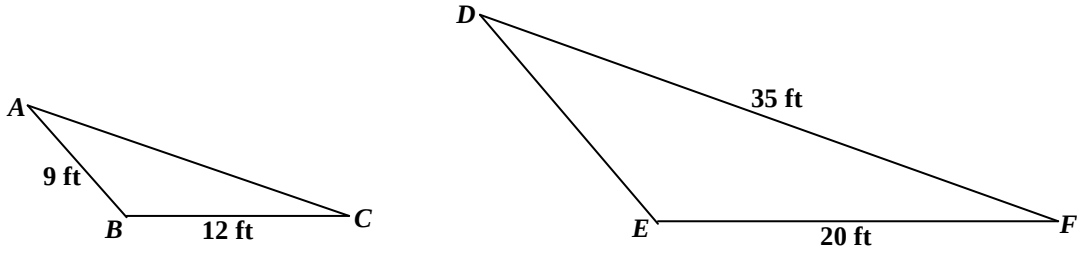
2. Can a quadrilateral have interior angle measurements of 128°, 82°, 60°, and 100°? Explain why or why not.

3. Sketch an equilateral triangle. Label the important parts.

4. In the diagram, $\Delta RST \sim \Delta RUV$. Find the lengths marked x and y.

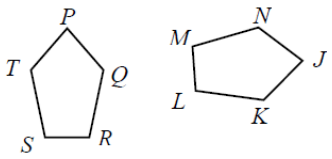


5. In the diagram, $\Delta ABC \sim \Delta DEF$. Find the lengths of $\overline{AC}$ and $\overline{DE}$.



6. The figure shown is an octagon. What is the sum of the measures on the interior angles?

7. Pentagon $PQRST \cong$ Pentagon $JKLMN$.



Complete the following statements.

a) $\angle Q \cong$ _____ b) $\overline{RS} \cong$ _____ c) $\overline{TP} \cong$ _____ d) $\angle J \cong$ _____

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Quiz

1. Identify the quadrilateral(s) that have exactly one pair of parallel sides.

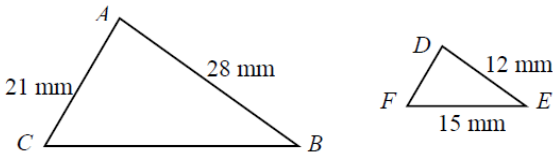
2. Complete the following statements where quadrilateral *RSTU* ≅ quadrilateral *VWXY*.

   a) $\angle S \cong$ _____ b) $\overline{RS} \cong$ _____ c) $\angle STU \cong$ _____ d) $\overline{UT} \cong$ _____

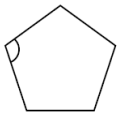
3. What is the sum of the interior angles of a regular octagon?

   A. 360° B. 720° C. 900° D. 1,080°

4. In the diagram below, $\Delta ABC \sim \Delta DEF$. Find the length of $\overline{BC}$ and $\overline{DF}$.

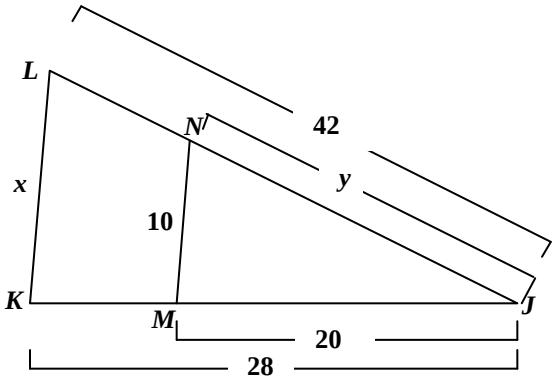


5. What is the sum of the interior angles of a pentagon?



6. The sum of the interior angles of a convex polygon is 720°. How many sides does the polygon have?

7. In the figure, $\Delta JKL \sim \Delta JMN$.



   Find the lengths marked *x* and *y*.

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Answers

Review 1- Answers

1) a) $\angle X$ b) $\overline{CE}$ c) $\angle XYZ$ d) $\overline{DE}$ e) $\angle E$ f) $\overline{YX}$
2) 2.5 cm
3) Parallelogram: mark opposite sides parallel and congruent, opposite angles congruent; Trapezoid: mark one pair of opposite sides parallel; Rectangle: mark opposite sides parallel and congruent, all right angles; Rhombus: mark all sides congruent; Square: mark all sides congruent, all right angles
4) 360°; 180°; 540°; 720°; $180(n-2)$
5) parallelogram, rectangle, rhombus, square
6) C
7) a) 6 b) 5 c) 8 d) 3 e) 10 f) 4 g) 9 h) 7

Review 2- Answers

1) $\angle A \cong \angle D$, $\angle B \cong \angle E$, $\angle C \cong \angle F$, $\overline{AB} \cong \overline{DE}$, $\overline{BC} \cong \overline{EF}$, $\overline{AC} \cong \overline{DF}$
2) A regular polygon has all sides congruent and all angles congruent.
3) E
4) Answers may vary.
5) no; 90° + more than 90° = more than 180°
6) $\overline{MK}$ corresponds to $\overline{LK}$, $\overline{NK}$ corresponds to $\overline{JK}$, $\overline{MN}$ corresponds to $\overline{LJ}$. $\angle M \cong \angle L$, $\angle N \cong \angle J$, $\angle MKN \cong \angle LKJ$.
7) a) False; Counterexample: Use the figure in #6 above. $\Delta JKL \sim \Delta NKM$, but not congruent. b) True

Review 3- Answers

1) octagon = 8 sides, $(8-2)180 = 1080^\circ$; hexagon = 6 sides, $(6-2)180 = 720^\circ$
2) no; $90^\circ + 90^\circ = 180^\circ$ and triangles have 3 angles, so the sum of the interior angles would be more than 180°
3) a) yes, concave decagon b) no, segments have multiple common endpoints c) no, curved sides
4) trapezoid with non-parallel sides marked congruent and consecutive angles marked congruent
5) hexagon = 6 sides, $(6-2)180 = 720^\circ$; $720^\circ \div 6 = \boxed{120^\circ}$
6) $AC = 48$ in, $DE = 11$ in
7) D

Review 4- Answers

1) no; more than 90° + more than 90° = more than 180°
2) no, 128° + 82° + 60° + 100° = 370° > 360°
3) triangle with all sides and all angles marked congruent
4) $x = 27$; $y = 25$
5) $AC = 21$ ft, $DE = 15$ ft
6) octagon = 8 sides, $(8-2)180 = 1080^\circ$
7) a) $\angle K$ b) $\overline{LM}$ c) $\overline{NJ}$ d) $\angle P$

Quiz - Answers

1) trapezoid
2) a) $\angle W$ b) $\overline{VW}$ c) $\angle WXY$ d) $\overline{YX}$
3) D

4) $BC = 35\,\text{mm},\ DF = 9\,\text{mm}$
5) 540°
6) 6 sides
7) $x = 14;\ y = 30$