

September 10, 2018

What are the scale factors for the following figures??

$(2, 3) \times (2) = (4, 6)$
 scale factor

How do you know?

$(-2, 4) \times \frac{1}{2} = (-1, 2)$
 scale factor

Sep 6-9:58 AM

Triangle Midsegment Theorem

p 341 Read and copy the Triangle Midsegment Theorem

Draw a picture of what you think the Triangle Midsegment is describing...

D, E are midpoints

DE is the midsegment

$DE = \frac{1}{2} BC$
 $2DE = BC$

Sep 6-9:59 AM

p342

Your Turn

6. Find JL, PM, and $m\angle MLK$.

$JL = 2(39) = 78$
 $PM = \frac{1}{2}(95) = 47.5$
 $\angle MLK = 105^\circ$

Elaborate

7. Discussion Explain why \overline{XY} is NOT a midsegment of the triangle.

$X \times Y$ were not the midpoints!

8. Essential Question Check-In Explain how the perimeter of $\triangle DEF$ compares to that of $\triangle ABC$.

The perimeter of $\triangle DEF$ is $\frac{1}{2}$ the perimeter of $\triangle ABC$
 The perimeter of $\triangle ABC$ is 2 times the perimeter of $\triangle DEF$

Sep 6-10:03 AM

p343

find each measure.

5 minutes!

6. $XY = \frac{1}{2}(45.8) = 22.9$
 7. $BZ = \frac{1}{2} BC = \frac{1}{2}(15.8) = 7.9$
 8. $AX = 4.6$
 9. $m\angle YZC = 68^\circ$
 10. $m\angle XNY = X \pm 68 = 180$ $X = 112$
 Algebra Find the value of each variable.

11. $2(6n) = 48$
 $12n = 48$
 $n = 4$

12. $2(11.5) = n + 4.2$
 $22.6 = n + 4.2$
 $-4.2 = -4.2$
 $18.4 = n$
 $n = 3$

13. $2(n+12) = 6n$
 $2n+24 = 6n$
 $-2n$
 $24 = 4n$
 $4 = 4$
 $6 = n$

14. $2(4n+9) = 14n$
 $8n+18 = 14n$
 $-8n$
 $18 = 6n$
 $6 = 6$
 $3 = n$

Sep 6-10:05 AM

p 344

15. Line segment \overline{XY} is a midsegment of $\triangle MNP$. Determine whether each of the following statements is true or false.

3 are T
 3 are F

a. $MP = 2XY$ T ✓
 b. $MP = \frac{1}{2} XY$ F ✓
 c. $MX = XN$ T ✓
 d. $MX = \frac{1}{2} NX$ F ✓
 e. $NX = \frac{1}{2} YN$ F ✓
 f. $XY = \frac{1}{2} MP$ T ✓

Sep 6-10:05 AM

Triangle Midsegment

In each triangle, M, N, and P are the midpoints of the sides. Name a segment parallel to the one given.

1) $JK \parallel \overline{XV}$
 2) $MN \parallel \overline{EG}$
 3) $CD \parallel \overline{MP}$
 $DN \parallel \overline{MP}$
 $CN \parallel \overline{MP}$
 Find the missing length indicated.
 5) Find FC
 $\frac{1}{2}(22) = 11$
 6) Find FR
 $2(2) = 4$
 7) Find EX
 6
 8) Find FR
 10

Sep 6-10:10 AM

Solve for x.

9) $x+12 = 2(2x-9)$

10) $2x-9 = x+16$

11) $x+3 = 2(2x-9)$

12) $x+16 = 2x-12$

Find the missing length indicated.

13) Find PR $x+30 = 2(x+20)$

14) Find AC $2x-12 = 2x-16$

15) Find RS $1.4+x = 2(2x+16)$

16) Find PR $2x+6 = 2x-5$

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Find y. y

Find x and the length of AB. $3x-1$

Sep 6-10:07 AM

Parallelogram vocabulary

Define the following words and draw a picture

- quadrilateral
- parallelogram
- diagonal

Sep 6-10:08 AM

Properties of parallelograms

One special kind of polygons is called a parallelogram. It is a quadrilateral where both pairs of opposite sides are parallel.

There are six important properties of parallelograms to know:

1. Opposite sides are congruent ($AB = DC$), ($AD = BC$)
2. Opposite angles are congruent ($D = B$), ($A = C$)
3. Consecutive angles are supplementary ($A + D = 180^\circ$), ($A + B = 180^\circ$)
4. If one angle is right, then all angles are right.
5. The diagonals of a parallelogram bisect each other.
6. Each diagonal of a parallelogram separates it into two congruent triangles. $\triangle BEC \cong \triangle DEA$, $\triangle AEO \cong \triangle CEO$

Sep 6-10:12 AM

p 363 copy theorems
p 364 copy theorem

p368 10-13

A staircase handrail is made from congruent parallelograms. In $\square PQRS$, $PQ = 17.5$, $ST = 18$, and $m\angle QRS = 110^\circ$. Find each measure. Explain.

10. $RS = 17.5$

11. $QT = 18$

12. $m\angle PQR = 70^\circ$

13. $m\angle SPQ = 70^\circ$

$\angle Q + \angle P = 180^\circ$
 $70^\circ + \angle P = 180^\circ$
 $-\ 70$
 $\angle P = 110^\circ$

Sep 6-10:14 AM

p 371 copy theorem
p 372 copy theorems
p 373 copy theorem

n 378

Show that each quadrilateral is a parallelogram for the given values of the variables.

5. $x = 4$ and $y = 9$ $u = 8$ and $v = 3.5$

Yes, opposite sides are congruent

SD, 27
LB Congruent
GS, 27

Determine if each quadrilateral must be a parallelogram. Justify your answer.

7. Yes
parallel symbol \parallel equal

8. No!
equal sides \neq equal \angle s

9. No!
equal sides \neq equal \angle s

10. No!

11. No!
 $107^\circ + 73^\circ = 180^\circ$
 $73 + 107 = 180$
Yes opposite angles are \cong

12. No!
 $123^\circ + 57^\circ = 180^\circ$
 $57 + 123 = 180$
Yes opposite angles are \cong

Sep 6-10:16 AM

Parallelograms

Solve for x . Each figure is a parallelogram.

opposite \angle are congruent.

1) $135 = 46x - 3$
 $+3$
 $138 = 46x$
 $\frac{138}{46} = \frac{46x}{46}$
 $3 = x$

2) $9 = 16x$
 $17x = 3$
 $x = 6$

3) $13 = 4x - 3$
 $+3$
 $16 = 4x$
 $\frac{16}{4} = \frac{4x}{4}$
 $4 = x$

4) $85 + 32x - 1 = 180$
 $-84 + 32x = 181$
 $-84 + 84 + 32x = 181 - 84$
 $32x = 97$
 $\frac{32x}{32} = \frac{97}{32}$
 $x = \frac{97}{32}$

5) $3x - 3 = x + 3$
 $-x -x$
 $2x - 3 = 3$
 $+3 +3$
 $2x = 6$
 $\frac{2x}{2} = \frac{6}{2}$
 $x = 3$

6) $85 + 32x - 1 = 180$
 $-84 + 32x = 181$
 $-84 + 84 + 32x = 181 - 84$
 $32x = 97$
 $\frac{32x}{32} = \frac{97}{32}$
 $x = \frac{97}{32}$

7) $2x = x + 11$
 $-x -x$
 $x = 11$

8) $13 = x + 4$
 $-4 -4$
 $9 = x$

9) $3x + 1$
 $3 = 2x$
 $x = 2$

10) $40 = x - 5$
 $+5 +5$
 $45 = x$

TRY 3 more

Sep 6-10:19 AM

Find the measurement indicated in each parallelogram.

13) Find CD
 $x + 6 = 2x - 5$
 $-x -x$
 $6 = x - 5$
 $+5 +5$
 $11 = x$
 $CD = 2x - 5$
 $CD = 2(11) - 5 = 17$

14) Find $m\angle D$
 $13 + 13x$
 118
 $-1 + 9x$

15) Find RS
 $LB = 50$
 $GB = 14$
 $JP = 14$
 $2x + 14$

16) Find $m\angle X$
 $U = 67$
 $x + 67$
 $2x + 67$

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14) Find $m\angle D$

$13 + 15x$
 $13 + 15x = -1 + 9x$
 $-1 + 9x + 13 + 15x = 180$
 $12 + 24x = 180$
 $-12 -12$
 $24x = 168$
 $\frac{24x}{24} = \frac{168}{24}$
 $x = 7$
 $m\angle D = 13 + 15x$
 $m\angle D = 13 + 15(7)$
 $m\angle D = 118$

Sep 11-11:45 AM

Objectives

Prove certain triangles are similar by using AA, SSS, and SAS.

Use triangle similarity to solve problems.

Postulate 7-3-4 Angle-Angle (AA) Similarity

| POSTULATE | HYPOTHESIS | CONCLUSION |
|--|------------|------------------------------------|
| If two angles of one triangle are congruent to two angles of another triangle, then the triangles are similar. | | $\triangle ABC \sim \triangle DEF$ |

Sep 12-7:56 AM

Theorem 7-3-2 Side-Side-Side (SSS) Similarity

| THEOREM | HYPOTHESIS | CONCLUSION |
|---|------------|------------------------------------|
| If the three sides of one triangle are proportional to the three corresponding sides of another triangle, then the triangles are similar. | | $\triangle ABC \sim \triangle DEF$ |

Theorem 7-3-3 Side-Angle-Side (SAS) Similarity

| THEOREM | HYPOTHESIS | CONCLUSION |
|---|------------|------------------------------------|
| If two sides of one triangle are proportional to two sides of another triangle and their included angles are congruent, then the triangles are similar. | | $\triangle ABC \sim \triangle DEF$ |

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Are the triangles similar by AA, SAS or SSS?

Verify that the triangles are similar.

$\triangle PQR$ and $\triangle STU$ same, YES

$\frac{PQ}{ST} = \frac{3}{4.5} = \frac{2}{3} = .67$
 $\frac{QR}{TU} = \frac{3}{4.5} = \frac{2}{3} = .67$
 $\frac{PR}{SU} = \frac{2}{3} = .67$

Therefore $\triangle PQR \sim \triangle STU$ by SSS.

Example 1: Using the AA Similarity Postulate

Explain why the triangles are similar and write a similarity statement.

$\triangle ABC \sim \triangle DEC$

vertical angles = equal.

Verify that the triangles are similar.

$\triangle DEF$ and $\triangle HJK$

$\angle D \cong \angle H$ by the Definition of Congruent Angles.

$\frac{DE}{HJ} = \frac{2}{1} = 2$ $\frac{DF}{HK} = \frac{5.8}{2.9} = 2$ $70^\circ = 70^\circ$

Therefore $\triangle DEF \sim \triangle HJK$ by SAS.

Sep 12-7:59 AM

AA, SAS, or SSS similarity & how do you know?

AA vertical angles

SAS

SAS

AA

$\frac{12}{15} = \frac{16}{20} = .8$

$\frac{12}{16} = .75$, $\frac{15}{20} = .75$

$180 - 90 - 43 = 47$

Sep 12-8:01 AM

Geometry Name: _____ ID: 1

Triangle Similarity: AA, SAS, SSS using proportions Date: _____ Period: _____

Find the missing length indicated. Leave your answer in simplest radical form.

1) $x^2 = 10000 - 3600$
 $x = 80$

2) $x^2 = 625 - 225$
 $x = 20$

3) $x^2 = 256 - 81$
 $x = 5\sqrt{7}$

4) $x^2 = 625 - 400$
 $x = 15$

5) $x^2 = 100 - 36$
 $x = 8$

6) $x^2 = 144 - 64$
 $x = 4\sqrt{5}$

State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.

7) $\triangle RUT \sim \triangle \dots$

8) $\triangle XLM \sim \dots$

Sep 12-7:53 AM

9) $\triangle BCD \sim \dots$

10) $\triangle KLM \sim \dots$

Solve for x. The triangles in each pair are similar.

11) $\triangle DEF \sim \triangle DBA$

12) $\triangle MNP \sim \triangle RST$

Find the missing length. The triangles in each pair are similar.

13) $\triangle LMN \sim \triangle LSR$

14) $\triangle JKL \sim \triangle CDE$

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State if the triangles in each pair are similar. If so, state how you know they are similar and complete the similarity statement.

1) $\triangle SDC \sim \dots$

2) $\triangle KLM \sim \triangle KEF$
similar, SAS similarity, $\triangle KEF$

3) $\triangle BCD \sim \dots$
similar, SSS similarity, $\triangle BCD$

4) $\triangle UTS \sim \dots$
not similar

Calculations: $\frac{98}{14} = \frac{10}{10} = \frac{70}{7} = 7$

Calculations: $\frac{42}{14} = 3$, $\frac{30}{10} = 3$, $\frac{14}{7} = 2$

Sep 12-10:38 AM

Unit 2 - Dilations & Similarity Study Guide

1) A dilation is a transformation that results in similar figures. Therefore, the corresponding parts of both shapes share these properties (except which one)?

A) Congruent angles B) Disjoint points C) Co-linear points D) Proportional sides E) Congruent sides

2) Dilate the polygon by a scale factor of $\frac{1}{2}$ about the origin and list the post-image points as decimals.

3) Dilate the triangle by a scale factor of $\frac{1}{2}$ about the origin and list the post-image points as decimals.

In the figure on the right, determine the following information:

4) Similarity Ratio: $\frac{3}{2}$

5) Scale Factor: $\frac{3}{2}$

Point: $A \frac{1}{2} \frac{b}{2} = 3$

Triangle Similarity Theorem

6) $\triangle ABC \sim \triangle DEF$ by AA, $180 - 90 - 50 = 40$

7) $\triangle GHI \sim \triangle JKL$ by SSS, $\frac{18}{6} = \frac{24}{8} = \frac{30}{10} = 3$

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8) $\triangle XYZ \sim \triangle ABC$ by SSS, $\frac{4}{8} = \frac{6}{10} = \frac{7}{14} = .5$

9) $\triangle DEF \sim \triangle GHI$ by SSS, $\frac{10.5}{3.5} = \frac{6}{3.5} = \frac{6.20}{3.5} = 3$

10) $\triangle JKL \sim \triangle MNO$ by SSS, $\frac{14}{7} = \frac{10}{5} = \frac{12}{6} = 2$

11) $\triangle PQR \sim \triangle STU$ by SSS, $\frac{14}{7} = \frac{12}{6} = \frac{14}{7} = 2$

12) $\triangle VWX \sim \triangle YZ$ by SSS, $\frac{18}{3.5} = \frac{10.5}{3.5} = \frac{6.20}{3.5} = 5.14$

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Sep 13-11:27 AM

p 384 property of rectangles
p 385 property of rhombuses

p 388

Find the lengths using rectangle $ABCD$.

- $AB = 21$; $AD = 28$. What is the value of $AC + BD$?
- $BC = 40$; $CD = 30$. What is the value of $BD - AC$?

- An artist connects stained glass pieces with lead strips. In this rectangular window, the strips are cut so that $FH = 34$ in. Find JG . Explain.

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The rectangular gate has diagonal braces. Find each length.

- Find HJ .
- Find HK .

- Find the measure of each numbered angle in the rectangle.

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p 395 theorem
p 396 theorems

p399-400

Determine whether each quadrilateral must be a rectangle. Explain.

- Given: $BD = AC$
-

Sep 6-10:28 AM

p 400

Each quadrilateral is a parallelogram. Determine whether each parallelogram is a rhombus or not.

-
-

Give one characteristic about each figure that would make the conclusion valid.

- Conclusion: $JKLM$ is a rhombus.
- Conclusion: $PQRS$ is a square.

Sep 6-10:30 AM

p 401


In Exercises 13–16, Determine which quadrilaterals match the figure: parallelogram, rhombus, rectangle, or square? List all that apply.

- Given: $\overline{XY} \cong \overline{ZW}$, $\overline{XY} \parallel \overline{ZW}$, $\overline{WY} \cong \overline{XZ}$, $\overline{WY} \perp \overline{XZ}$.
- Given: $\overline{XY} \cong \overline{ZW}$, $\overline{XW} \cong \overline{ZY}$, $\overline{WY} \cong \overline{XZ}$.
- Given: $\angle WXY \cong \angle YZW$, $\angle XWZ \cong \angle ZYX$, $\angle XWY \cong \angle YWZ$, $\angle XYW \cong \angle ZYW$.
- Given: $m\angle WXY = 130^\circ$, $m\angle XWZ = 50^\circ$, $m\angle WZY = 130^\circ$.

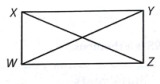
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In Exercises 13–16, Determine which quadrilaterals match the figure: parallelogram, rhombus, rectangle, or square? List all that apply.


13. Given: $\overline{XY} \cong \overline{ZW}$, $\overline{XY} \parallel \overline{ZW}$, $\overline{WY} \cong \overline{XZ}$, $\overline{WY} \perp \overline{XZ}$



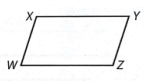
14. Given: $\overline{XY} \cong \overline{ZW}$, $\overline{XW} \cong \overline{ZY}$, $\overline{WY} \cong \overline{XZ}$



15. Given: $\angle WXY \cong \angle YZW$, $\angle XWZ \cong \angle ZYX$, $\angle XWY \cong \angle YWZ$, $\angle XYW \cong \angle ZYW$



16. Given: $m\angle WXY = 130^\circ$, $m\angle XWZ = 50^\circ$, $m\angle WZY = 130^\circ$



Sep 6-10:31 AM

Quadrilateral G.O.

Quadrilaterals – Properties Chart

Complete the properties chart for each quadrilateral. Tell how many and which angles or sides fit each description. Tell the characteristics of the diagonals for each quadrilateral.

| Figure | Congruent Angles | Congruent Sides | Parallel Sides | Diagonals |
|---------------------|------------------|-----------------|----------------|-----------|
| Parallelogram | | | | |
| Rectangle | | | | |
| Rhombus | | | | |
| Square | | | | |
| Trapezoid | | | | |
| Isosceles Trapezoid | | | | |
| Kite | | | | |

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Quadrilaterals – Flow Chart

Complete the flow chart with the name of the appropriate quadrilateral. Include a diagram to represent each quadrilateral.

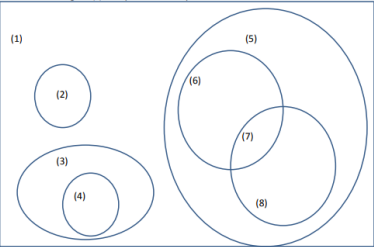
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    graph TD
      A[Quadrilateral ABCD] --> B[If 2 pair opposite sides are parallel, ABCD is a (1)]
      A --> C[If 1 pair opposite sides are parallel, ABCD is a (2)]
      A --> D[If no opposite sides are parallel, ABCD is a (3)]
      B --> E[If diagonals are congruent, ABCD is a (4)]
      B --> F[If diagonals are perpendicular, ABCD is a (5)]
      C --> G[If diagonals are congruent, ABCD is a (6)]
      D --> H[If two pair consecutive sides are congruent, ABCD is a (7)]
      E --> I[If diagonals are both = and ⊥, ABCD is a (8)]
  
```

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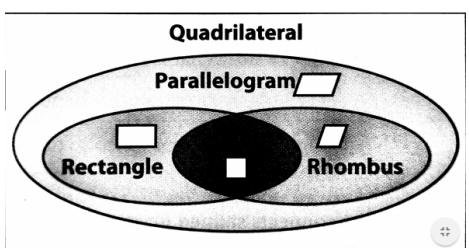
Quadrilaterals – Venn Diagram

Complete the Venn diagram with the name of the appropriate quadrilateral. Include a diagram(s) to represent each quadrilateral.



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Let's discuss this...



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Sep 6-10:34 AM

p 404 Four Kite Theorem
 p 405 Thee Isosceles Trapezoid Theorems
 p 408 Trapezoid midsegment Theorem

Sep 6-10:35 AM

p 410

Evaluate: Homework and Practice

In kite $ABCD$, $m\angle BAE = 28^\circ$ and $m\angle BCE = 57^\circ$. Find each measure.

- $m\angle ABE$
- $m\angle CBE$
- $m\angle ABC$
- $m\angle ADC$

Sep 6-10:44 AM

p 412-413

Use the isosceles trapezoid to find each measure or value.

7. $LJ = 19.3$ and $KN = 8.1$. Determine MN .

8. Find the positive value of x so that trapezoid PQRS is isosceles.

9. In isosceles trapezoid EFGH, use the Same-Side Interior Angles Postulate to determine $m\angle E$.

10. $AC = 3y + 12$ and $BD = 27 - 2y$. Determine the value of y so that trapezoid ABCD is isosceles.

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Find the unknown segment lengths in each trapezoid.

11. In trapezoid ABCD, find XY .

12. In trapezoid EFGH, find FG .

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13. In trapezoid PQRS, $PQ = 4RS$. Determine XY .

14. In trapezoid JKLM, $PQ = 2JK$. Determine LM .

Algebra Find the length of the midsegment of each trapezoid.

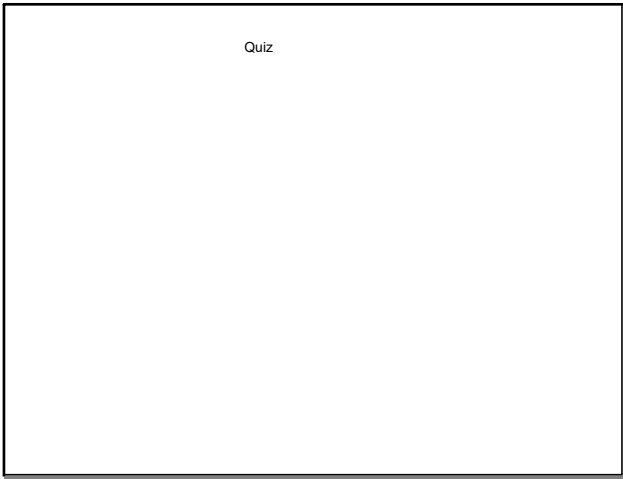
18.

19.

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Study Guide

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Sep 6-12:47 PM