

هيكل مراجعة الرياضيات للصف التاسع المتقدم



تم تحميل هذا الملف من موقع المناهج الإماراتية

موقع المناهج ← المناهج الإماراتية ← الصف التاسع المتقدم ← رياضيات ← الفصل الثالث ← ملفات متنوعة ← الملف

تاريخ إضافة الملف على موقع المناهج: 09:48:06 2026-06-02

ملفات اكتب للمعلم اكتب للطالب ا اختبارات الكترونية ا اختبارات ا حلول ا عروض بوربوينت ا أوراق عمل
منهج انجليزي ا ملخصات وتقارير ا مذكرات وبنوك ا الامتحان النهائي ا للمدرس

المزيد من مادة
رياضيات:

إعداد: معهد رواد التعليمية

التواصل الاجتماعي بحسب الصف التاسع المتقدم



صفحة المناهج
الإماراتية على
فيسبوك

الرياضيات

اللغة الانجليزية

اللغة العربية

التربية الاسلامية

المواد على تلغرام

المزيد من الملفات بحسب الصف التاسع المتقدم والمادة رياضيات في الفصل الثالث

ريفييل Disprove conjectures by using counterexamples

1

ملزمة هيكل 2026

2

Reveal Coverage Grade 9 Advanced

3

Reveal Coverage Grade 9 Advanced

4

تجميعية هيكل الفيزياء 2026

5

هيكل الرياضيات ريفيل للمصف التاسع متقدم الفصل الثالث 2026

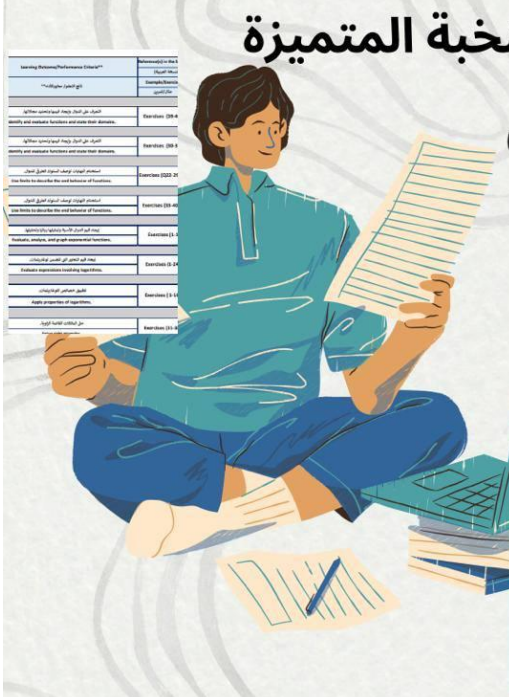
يعلن معهد رواد التعليمية ومركز النخبة المتميزة

حصص مراجعات وحل الهياكل

لجميع المواد: رياضيات فيزياء كيمياء احياء
عربي انجليزي اسلامية
للعام والمتقدم والتكنولوجيا

متوفر حضوري و اونلاين

للتواصل والاستفسار:
971566494600



Counter Example & wrong example to show
that a statement is false

Statement: a person can only
have one sister. False.

Counter example: Medey has no sister

1	Disprove conjectures by using counterexamples	(EX5,18-23)	706, 708
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Example 5 Find Counterexamples

Find a counterexample to show that each conjecture is false.

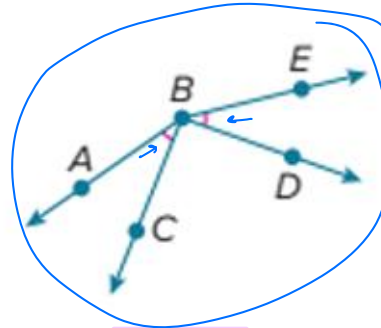
- ✓ a. If n is a real number, then $-n$ is a negative number. $\Rightarrow$ False, if $n = -2$, $-n = -(-2) = +2$
 $n = 0$, $-n = 0$

When n is -4 , $-n$ is $-(-4)$ or 4 , which is a positive number. Because $-n$ is not negative, this is a counterexample.

- b. If $\angle ABC \cong \angle DBE$, then $\angle ABC$ and $\angle DBE$ are vertical angles.

When points A, B , and D are noncollinear and points E, B , and C are noncollinear, the conjecture is false.

In the figure, $\angle ABC \cong \angle DBE$, but $\angle ABC$ and $\angle DBE$ are not vertical angles.



Check

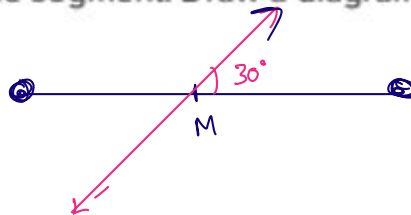
Find a counterexample to show that each conjecture is false.

- a. If n is a real number, then $\frac{1}{n} < n$. Select all that apply.

A. $n = -3$ B. $n = \frac{1}{4}$ C. $n = 1$ D. $n = 5$ E. $n = 100$

- b. If a line intersects a segment at its midpoint, then the line is perpendicular to the segment. Draw a diagram to represent the counterexample.

makes 90°



a. $\frac{1}{n} < n$

A. if $n = -3$

$$\frac{1}{-3} < -3$$

false

B. $n = \frac{1}{4}$

$$\frac{1}{1/4} < \frac{1}{4}$$

$$4 < \frac{1}{4}$$

false

C. $n = 1$

$$\frac{1}{1} < 1$$

$$1 < 1$$

false

D. $n = 5$

$$\frac{1}{5} < 5$$

True

E. $n = 100$

$$\frac{1}{100} < 100$$

$$0.01 < 100$$

True

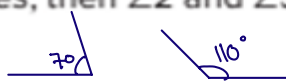
Example 5

Determine whether each conjecture is *true* or *false*. Find a counterexample for any false conjecture.

18. If n is a prime number, then $n + 1$ is not prime. *False*
 $n = 2$, $n + 1 = 3$ is also prime

19. If x is an integer, then $-x$ is positive. *False*
 $x = 2$, $-x = -2$ not positive.

20. If $\angle 2$ and $\angle 3$ are supplementary angles, then $\angle 2$ and $\angle 3$ form a linear pair. *True*
 $\rightarrow$ add up to 180



21. If you have three points A , B , and C , then A , B , and C are noncollinear. *False*.



22. If in $\triangle ABC$, $(AB)^2 + (BC)^2 = (AC)^2$, then $\triangle ABC$ is a right triangle. *True!*
Pythagorean theorem.

23. If the area of a rectangle is 20 square meters, then the length is 10 meters and the width is 2 meters. *False!*

$$A = l \times w = 20$$

$$1 \times 20$$

$$5 \times 4$$

$$10 \times 2$$

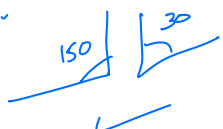
$$A = 20, l = 5, w = 4$$

$$l = 1, w = 20$$

Supplementary

any two angle
add up to 180

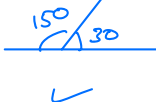
مترين اثنين
تضربوا لـ 180



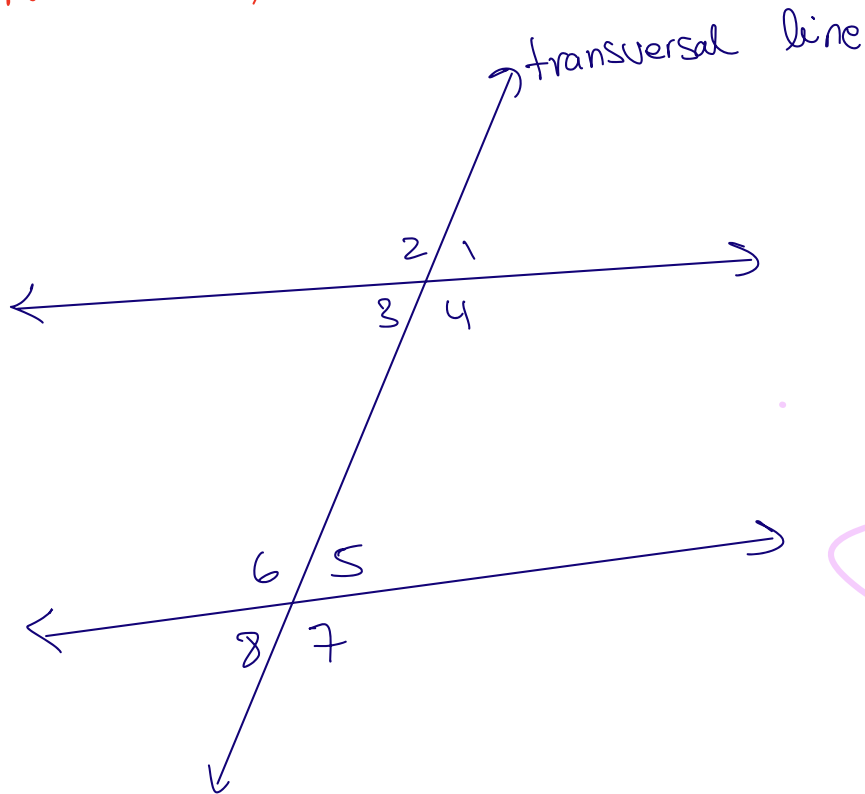
linear
pair

making straight
line

اصنعين
خط مستقيم



parallel lines + transversal



Corresponding:
one exterior and
one interior
(same side)
(1,5) (2,6)
(4,7) (3,8)

Vertical:
opposite
(1,3) (2,4)
(5,7) (6,8)

interior
between the two parallel
lines

exterior
outside the parallel
lines

1, 2, 7, 8

3, 4, 5, 6

alternate
Equal
(3,5)
(4,6)

consecutive
add up to 180
(4,5)
(3,6)

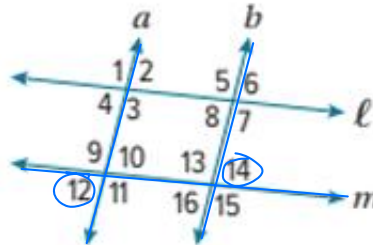
alternate
equal
(2,7)
(1,8)

consecutive
add up to 180
(7,1)
(2,8)

2	Apply angle relationship theorems to identify parallel lines and find missing values	(EX1-1-6)	776,779
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Example 1 Identify Parallel Lines

Use the given information to determine which lines, if any, are parallel. State the postulate or theorem that justifies your answer.



a. $\angle 2 \cong \angle 8$

$\angle 2$ and $\angle 8$ are alternate interior angles of lines a and b .

Because $\angle 2 \cong \angle 8$, $a \parallel b$ by the Alternate Interior Angles Converse.

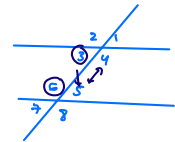
b. $\angle 3 \cong \angle 11$

$\angle 3$ and $\angle 11$ are corresponding angles of lines ℓ and m . Because $\angle 3 \cong \angle 11$, $\ell \parallel m$ by the Converse of the Corresponding Angles Theorem.

c. $\angle 12 \cong \angle 14$

$\angle 12$ and $\angle 14$ are alternate exterior angles of lines a and b .

Because $\angle 12 \cong \angle 14$, $a \parallel b$ by the Alternate Exterior Angles Converse.



interior : 3, 4, 5, 6

exterior : 1, 2, 7, 8

alternate interior : (4, 6) (3, 5)

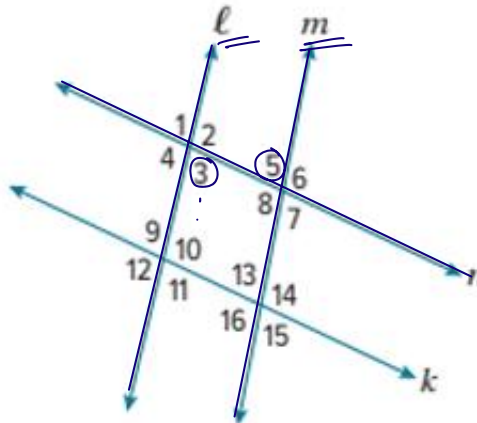
alternate exterior : (2, 8) (1, 7)

consecutive interior : (4, 5) (3, 6)

consecutive exterior : (1, 8) (2, 7)

Check

Use the given information to determine which lines, if any, are parallel. State the postulate or theorem that justifies your answer.



a. $\angle 1 \cong \angle 15$

A. $\ell \parallel m$; Alternate Exterior Angles Converse

B. $n \parallel k$; Alternate Exterior Angles Converse

C. $\ell \parallel m$; Converse of Corresponding Angles Theorem

D. It is not possible to determine whether the lines are parallel.

b. $m\angle 3 + m\angle 10 = 180$

$n \parallel k$, $\angle 3$ and $\angle 10$ consecutive interior

c. $\angle 3 \cong \angle 5$

A. $\ell \parallel m$; Alternate Interior Angles Converse

B. $\ell \parallel m$; Consecutive Interior Angles Converse

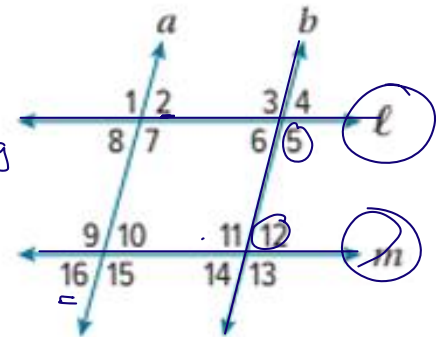
C. $n \parallel k$; Alternate Interior Angles Converse

D. It is not possible to determine whether the lines are parallel.

Example 1

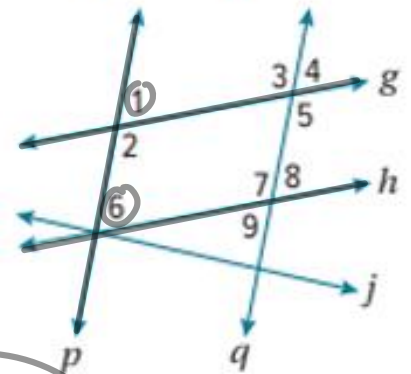
Use the given information to determine which lines, if any, are parallel. State the postulate or theorem that justifies your answer.

- | | |
|--|---|
| 1. $\angle 3 \cong \angle 7$ $a \parallel b$
alternate interior Angles converse | 2. $\angle 9 \cong \angle 11$
$a \parallel b$ corresponding |
| 3. $\angle 2 \cong \angle 16$ $l \parallel m$
alternate exterior. | 4. $m\angle 5 + m\angle 12 = 180^\circ$
consecutive interior $l \parallel m$. |

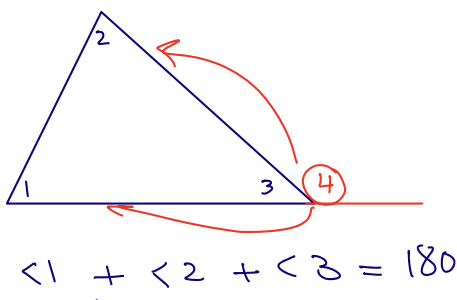
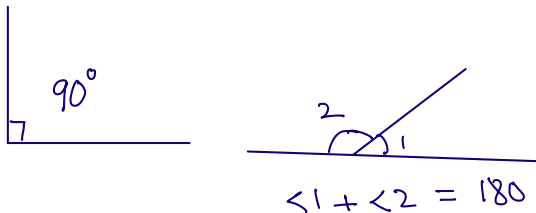
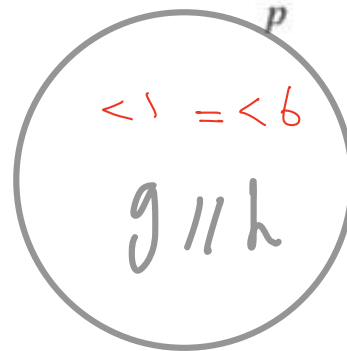


Given the following information, determine which lines, if any, are parallel. State the theorem that justifies your answer.

- | | |
|--|---|
| 5. $\angle 1 \cong \angle 6$
$g \parallel h$
corresponding | 6. $m\angle 7 + m\angle 6 = 180^\circ$
$p \parallel q$
consecutive interior |
|--|---|



Example 2



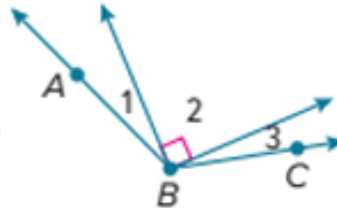
$$\angle 4 = \angle 1 + \angle 2$$

3	Prove theorems about angles by using the Angle Addition Postulate	(EX1,1-3)	747,753
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Example 1 Angle Addition Postulate

What is $m\angle 3$ if $m\angle 1 = 23^\circ$ and $m\angle ABC = 131^\circ$?

Choose from the reasons provided to justify each step.

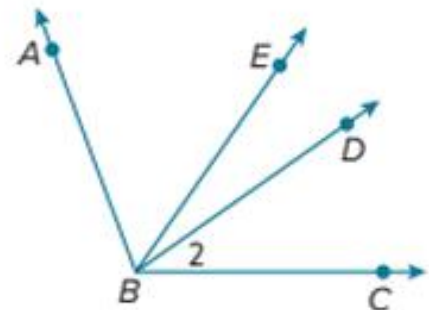


$m\angle 1 + m\angle 2 + m\angle 3 = m\angle ABC$	Angle Addition Postulate
$23^\circ + 90^\circ + m\angle 3 = 131^\circ$	Substitution Property
$113^\circ + m\angle 3 = 131^\circ$	Substitution Property
$113^\circ + m\angle 3 - 113^\circ = 131^\circ - 113^\circ$	Subtraction Property
$m\angle 3 = 18^\circ$	Substitution Property

Example 1

Find the measure of each angle.

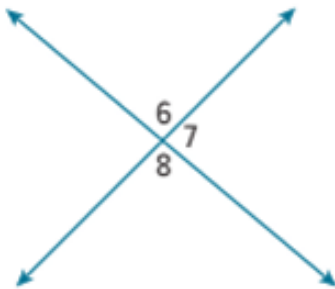
- Find $m\angle ABC$ if $m\angle ABD = 70^\circ$ and $m\angle DBC = 43^\circ$.
- If $m\angle EBC = 55^\circ$ and $m\angle EBD = 20^\circ$, find $m\angle 2$.
- Find $m\angle ABD$ if $m\angle ABC = 110^\circ$ and $m\angle 2 = 36^\circ$.



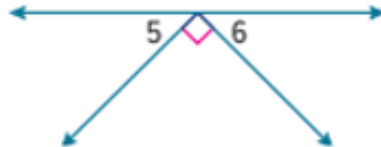
4	Prove theorems about angles by using properties and theorems of angle congruence	(13-18)	754
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Find the measure of each numbered angle and name the theorems that you used to justify your work.

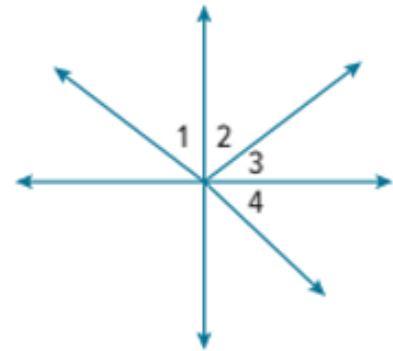
13. $m\angle 6 = (2x - 21)^\circ$
 $m\angle 7 = (3x - 34)^\circ$



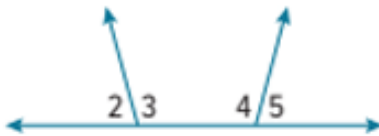
14. $m\angle 5 = m\angle 6$



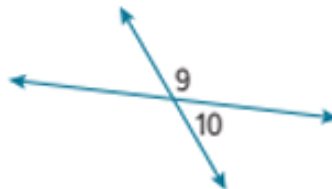
15. $\angle 2$ and $\angle 3$ are complementary.
 $\angle 1 \cong \angle 4$ and $m\angle 2 = 28^\circ$.



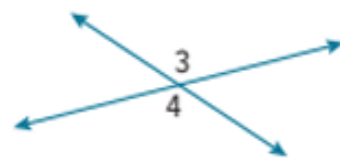
16. $\angle 2$ and $\angle 4$ and $\angle 4$ and $\angle 5$ are supplementary.
 $m\angle 4 = 105^\circ$.



17. $m\angle 9 = (3x + 12)^\circ$
 $m\angle 10 = (x - 24)^\circ$

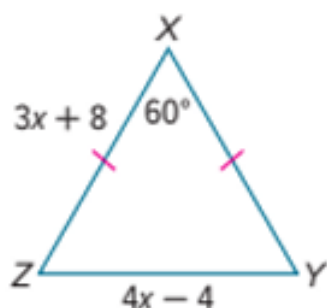


18. $m\angle 3 = (2x + 23)^\circ$
 $m\angle 4 = (5x - 112)^\circ$

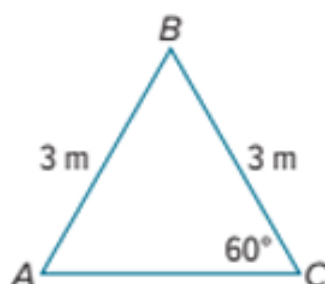


5	Solve problems involving equilateral triangles	(8-15)	880
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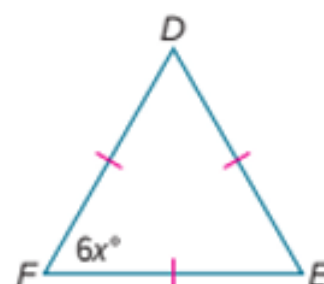
8. Find the value of x . **12**



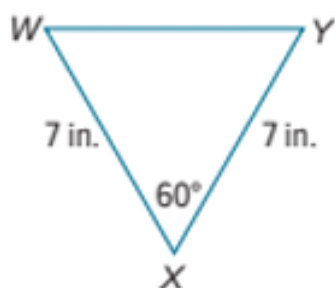
9. Find $m\angle B$ and AC . **60° ; 3 m**



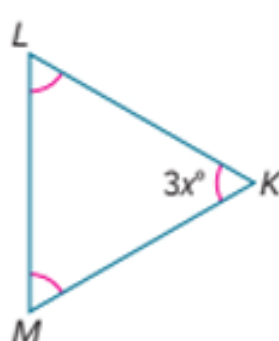
10. Find the value of x . **10**



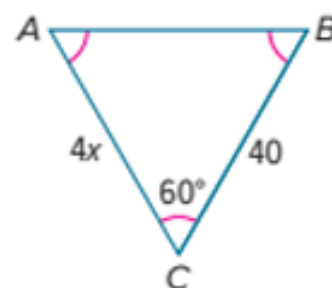
11. Find $m\angle Y$ and WY . **60° ; 7 in.**



12. Find the value of x . **20**



13. Find the value of x . **10**



6	Classify lines as parallel, perpendicular, or neither by comparing the slopes of the lines	(1-6)	771
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Determine whether $\overline{AB}$ and $\overline{CD}$ are *parallel*, *perpendicular*, or *neither*. Graph each line to verify your answer.

1. $A(1, 5), B(4, 4), C(9, -10), D(-6, -5)$ 2. $A(-6, -9), B(8, 19), C(0, -4), D(2, 0)$

3. $A(4, 2), B(-3, 1), C(6, 0), D(-10, 8)$ 4. $A(8, -2), B(4, -1), C(3, 11), D(-2, -9)$

5. $A(8, 4), B(4, 3), C(4, -9), D(2, -1)$ 6. $A(4, -2), B(-2, -8), C(4, 6), D(8, 5)$

7	Find the distance between parallel lines by using perpendicular distance	(9-14)	790
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Find the distance between each pair of parallel lines with the given equations.

9. $y = 7$
 $y = -1$

8 units

10. $x = -6$
 $x = 5$

11 units

11. $y = 3x$
 $y = 3x + 10$

$\sqrt{10}$ or about 3.16 units

12. $y = -5x$
 $y = -5x + 26$

$\sqrt{26}$ or about 5.10 units

13. $y = x + 9$
 $y = x + 3$

$3\sqrt{2}$ or about 4.24 units

14. $y = -2x + 5$
 $y = -2x - 5$

$2\sqrt{5}$ or about 4.47 units

8	Classify lines as parallel, perpendicular, or neither by comparing the equations of the lines	(EX5,22-25)	770,772
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Example 5 Write Equations of Parallel and Perpendicular Lines

Write an equation in slope-intercept form for the line parallel to

$$y = -\frac{3}{4}x + 3 \text{ containing } (-3, 6).$$

The slope of $y = -\frac{3}{4}x + 3$ is $-\frac{3}{4}$, so the slope of the line parallel to it is $-\frac{3}{4}$.

$$y = mx + b \quad \text{Slope-intercept form}$$

$$6 = -\frac{3}{4}(-3) + b \quad m = -\frac{3}{4} \text{ and } (x, y) = (-3, 6)$$

$$6 = \frac{9}{4} + b \quad \text{Simplify.}$$

$$\frac{15}{4} = b \quad \text{Subtract } \frac{9}{4} \text{ from each side.}$$

$$\text{So, the equation is } y = -\frac{3}{4}x + \frac{15}{4}.$$

Check

Write an equation in slope-intercept form for the line parallel to

$$y = \frac{1}{2}x + \frac{5}{2} \text{ containing } \left(\frac{3}{2}, 1\right).$$

Example 5

Write an equation in slope-intercept form for each line described.

22. passes through $(-7, -4)$, perpendicular to $y = \frac{1}{2}x + 9$

23. passes through $(-1, -10)$, parallel to $y = 7$

24. passes through $(6, 2)$, parallel to $y = -\frac{2}{3}x + 1$

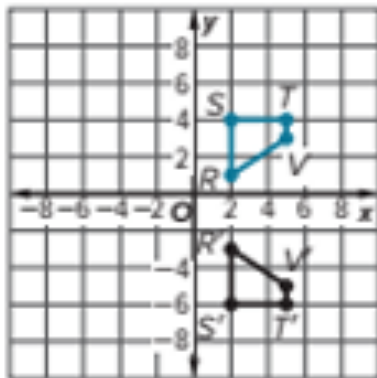
25. passes through $(-2, 2)$, perpendicular to $y = -5x - 8$

9	Use rigid motions to reflect figures on the coordinate plane and describe the effects of the reflections	(EX1,1-6)	799,801
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Example 1 Reflection in a Horizontal or Vertical Line

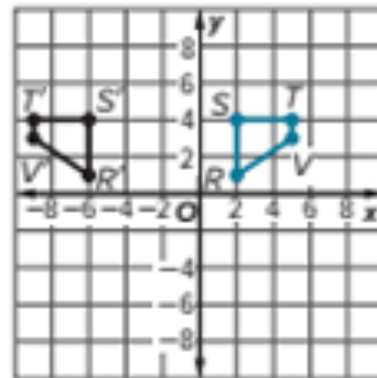
Consider quadrilateral $RSTV$ with vertices at $R(2, 1)$, $S(2, 4)$, $T(5, 4)$, and $V(5, 3)$. Graph the image of quadrilateral $RSTV$ under each reflection. Determine the coordinates of the image.

a. in the line $y = -1$



$R'(2, -3)$, $S'(2, -6)$,
 $T'(5, -6)$, $V'(5, -5)$

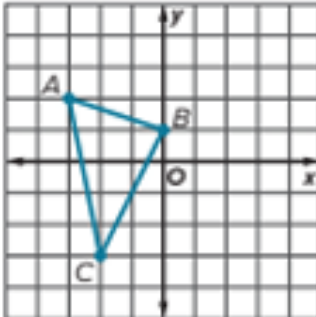
b. in the line $x = -2$



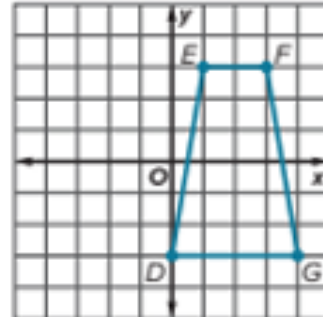
$R'(-6, 1)$, $S'(-6, 4)$,
 $T'(-9, 4)$, $V'(-9, 3)$

Graph the image of each figure under the given reflection. Determine the coordinates of the image.

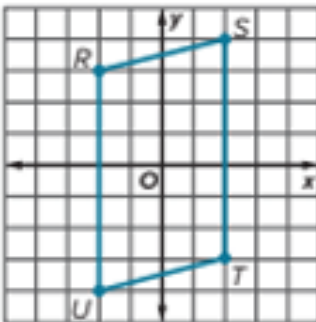
1. $\triangle ABC$ in the line $y = x$



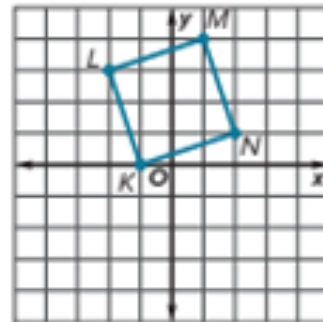
2. trapezoid $DEFG$ in the line $x = -1$



3. parallelogram $RSTU$ in the line $y = x$



4. square $KLMN$ in the line $y = -2$



5. Determine the coordinates of $S(-7, 1)$ after a reflection in the line $y = 3$.

6. Determine the coordinates of $Q(6, -4)$ after a reflection in the line $x = 2$.

Example 1 Determine a Translation Vector

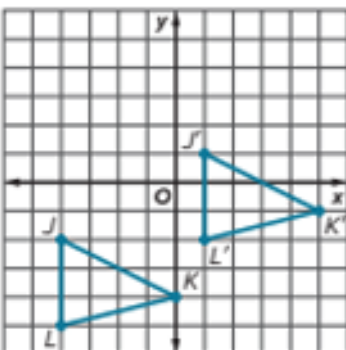
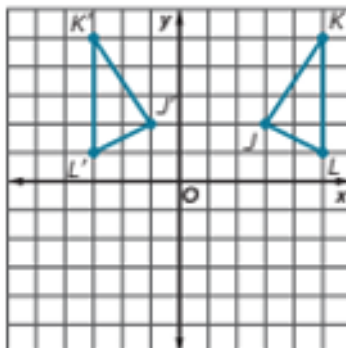
Determine whether a translation maps $\triangle JKL$ onto $\triangle J'K'L'$. If so, find the translation vector. If not, explain why.

$\triangle J'K'L'$ is not a translation of $\triangle JKL$.
The distances between corresponding vertices are not equal.

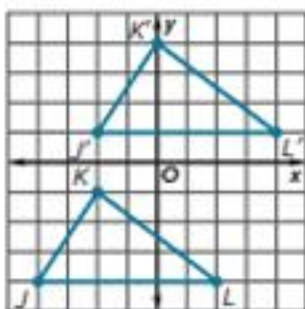
Check

Determine whether a translation maps $\triangle JKL$ onto $\triangle J'K'L'$. If so, find the translation vector. If not, explain why.

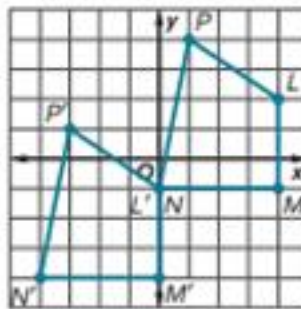
- A yes; $\langle 5, 3 \rangle$
- B yes; $\langle 3, 5 \rangle$
- C No; this is a reflection.
- D No; the triangles are not congruent.



- Determine whether a translation maps $\triangle JKL$ onto $\triangle J'K'L'$. If so, find the translation vector. If not, explain why.



- Determine whether a translation maps quadrilateral $LMNP$ onto quadrilateral $L'M'N'P'$. If so, find the translation vector. If not, explain why.



11	Use rigid motions to rotate figures about points that are not the origin and describe the effects of the rotations	(EX1,1-4)	807-809
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Example 1 Rotation About a Point That Is Not the Origin

Triangle ABC has vertices $A(-8, 5)$, $B(-6, 9)$, and $C(-3, 6)$. Graph $\triangle ABC$ and its image after a rotation of 180° about $(-5, 3)$.

Examples 1 and 2

- Triangle XYZ has vertices $X(0, 2)$, $Y(4, 4)$, and $Z(3, -1)$. Graph $\triangle XYZ$ and its image after a rotation of 180° about $(2, -3)$. **See margin.**
- Triangle ABC has vertices $A(1, 7)$, $B(3, 2)$, and $C(-2, -2)$. Graph $\triangle ABC$ and its image after a rotation of 270° counterclockwise about $(-4, 2)$. **See margin.**
- Triangle FGH has vertices $F(-3, 4)$, $G(2, 0)$, and $H(-1, -2)$. Graph $\triangle FGH$ and its image after a rotation of 180° about $(-3, -6)$. **See margin.**
- Quadrilateral $ABCD$ has vertices $A(-2, 4)$, $B(1, 3)$, $C(2, -3)$, and $D(-3, -1)$. Graph quadrilateral $ABCD$ and its image after a rotation of 90° counterclockwise about $(-1, 2)$. **See margin.**



12	Prove the Exterior Angle Theorem and apply the theorem to solve problems	(EX2,5-8)	841,843
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Example 2 Use the Exterior Angle Theorem

ARCHITECTURE Find the measure of $\angle DAB$ in the front face of the building.



$$m\angle DAB = m\angle ABC + m\angle BCA$$

Exterior Angle Theorem

$$12x + 7 = 6x - 4 + 65$$

Substitution

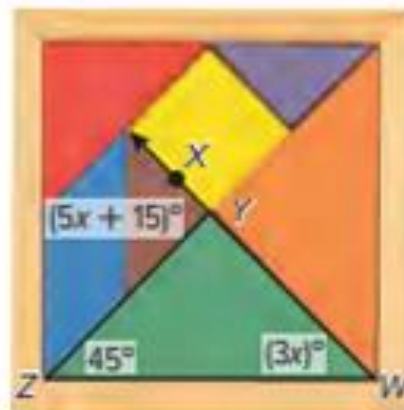
$$x = 9$$

Solve.

$$m\angle DAB = 12(9) + 7 \text{ or } 115^\circ$$

Check

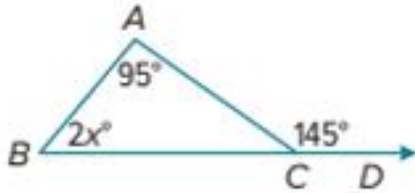
PUZZLES Find the measure of $\angle XYZ$ created by the triangle.



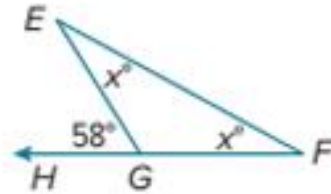
Go Online You can complete an Extra Example online.

Find each measure.

5. $m\angle ABC$



6. $m\angle F$



7. **TOWERS** A lookout tower sits on a network of struts and posts. Leslie measured two angles on the tower. If $m\angle 1 = (7x - 7)^\circ$, $m\angle 2 = (4x + 2)^\circ$, and $m\angle 3 = (2x + 6)^\circ$, what is $m\angle 1$?



8. **GARDENING** A gardener uses a grow light to grow vegetables indoors. If $m\angle 1 = (8x)^\circ$ and $m\angle 2 = (7x - 4)^\circ$, what is $m\angle 1$?



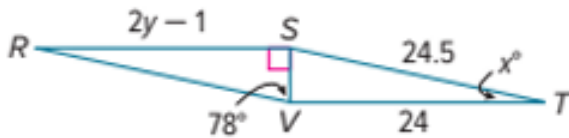
Example 3

Find each measure.

13	Use congruence criterion of corresponding congruent parts of triangles to solve problems	(EX2,6,7,10-13)	848,851,852
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Example 2 Use Corresponding Parts of Congruent Triangles

In the diagram, $\triangle RSV \cong \triangle TVS$. Find the values of x and y .



Part A Find the value of x .

$$\angle T \cong \angle R$$

CPCTC

$$m\angle T = m\angle R$$

Definition of congruence

$$= 180^\circ - 90^\circ - 78^\circ$$

Triangle Angle-Sum Theorem

$$= 12^\circ$$

Solve.

The value of x is 12.

Part B Find the value of y .

$$\overline{RS} \cong \overline{TV}$$

CPCTC

$$RS = TV$$

Definition of congruence

$$2y - 1 = 24$$

Substitution

$$y = 12.5$$

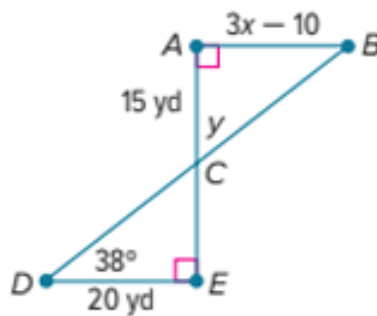
Solve.

The value of y is 12.5.

Check

In the diagram, $\triangle ABC \cong \triangle EDC$. Find the values of x and y .

$$x = \underline{\quad} ; y = \underline{\quad}$$

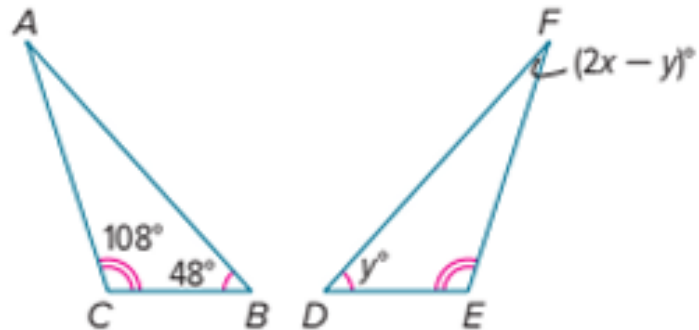


Example 2

In the diagram, $\triangle ABC \cong \triangle FDE$.

6. Find the value of x . **36**

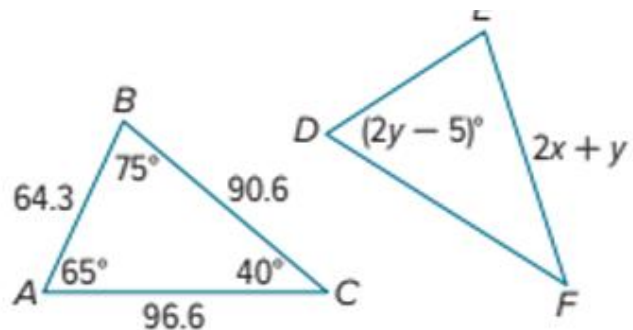
7. Find the value of y . **48**



In the diagram, $\triangle ABC \cong \triangle DEF$.

10. Find the value of x . **27.8**

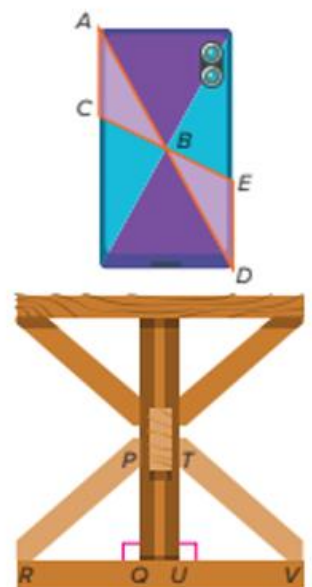
11. Find the value of y . **35**



Example 3

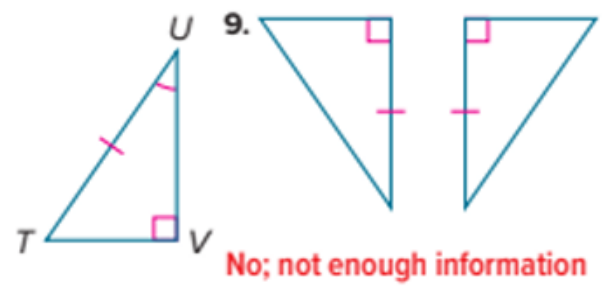
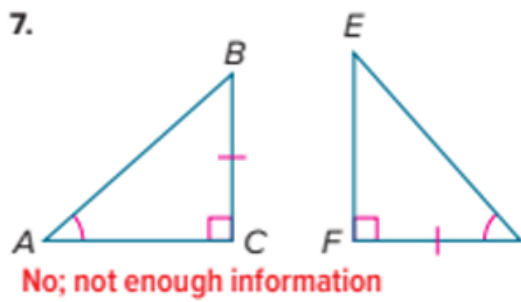
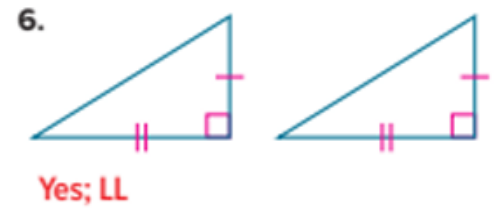
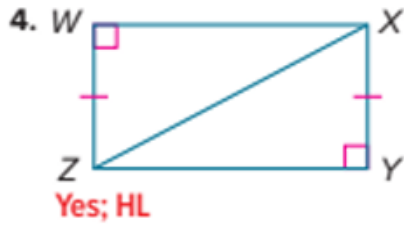
12. **DESIGN** Camila is designing a new image for her cell phone case. If $m\angle ABC = 35^\circ$, $m\angle BAC = 29^\circ$, and $\angle ACB \cong \angle DEB$, what is $m\angle DEB$?

13. **CARPENTRY** Mr. Lewis is building a rustic dining table. Instead of having four legs, the table has a set of supports at each end. If $\angle PRQ \cong \angle TVU$ and $m\angle RPQ = 49^\circ$, what is $m\angle TVU$?



14	Use the right triangle congruence theorems to prove relationships in geometric figures	(4-9)	873
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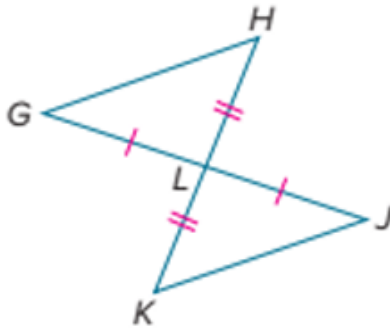
Determine whether each pair of triangles is congruent. If yes, include the theorem that applies.



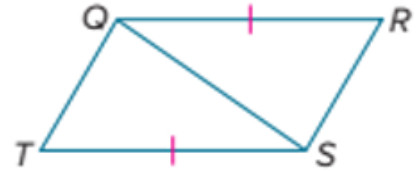
15	Use the SAS congruence criterion for triangles to solve problems	(17-20)	861
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Explain whether there is enough information given in each figure to prove that the triangles are congruent using SSS or SAS.

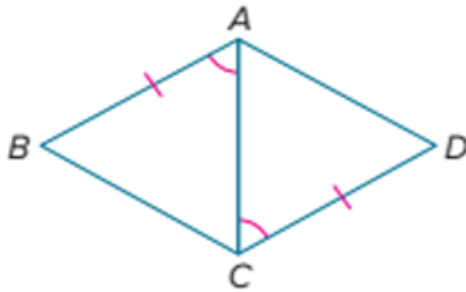
17.



18.



19.



20.

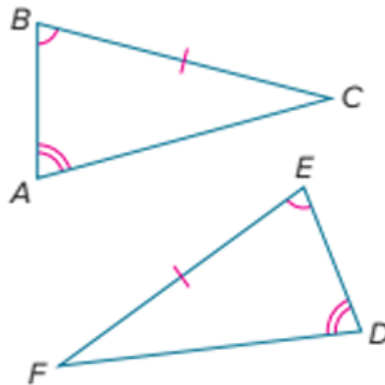


16	Use the AAS congruence criterion for triangles to prove relationships in geometric figures	theorem,Ex3(12-15)	865,866,869
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Theorem 14.5: Angle-Angle-Side (AAS) Congruence

Words If two angles and the nonincluded side of one triangle are congruent to the corresponding two angles and nonincluded side of a second triangle, then the two triangles are congruent.

Example If $\angle A \cong \angle D$,
 $\angle B \cong \angle E$, and
 $\overline{BC} \cong \overline{EF}$,
then $\triangle ABC \cong \triangle DEF$.

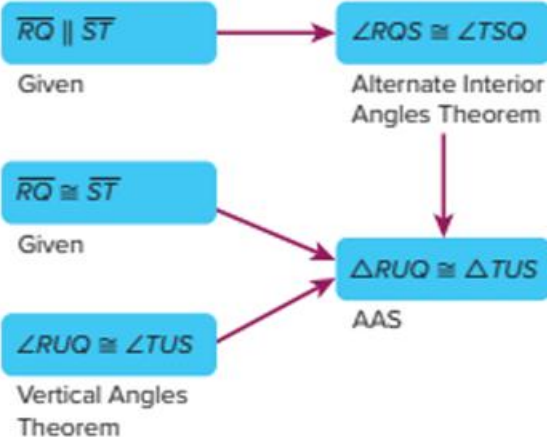
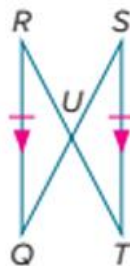


Example 3 Use AAS to Prove Triangles Congruent

Choose the correct statements and reasons to complete the flow proof.

Given: $\overline{RQ} \cong \overline{ST}$ and $\overline{RQ} \parallel \overline{ST}$

Prove: $\triangle RUQ \cong \triangle TUS$

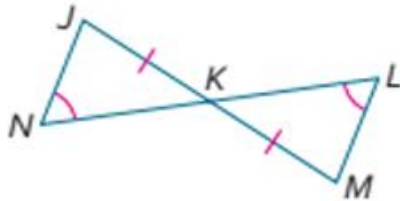


Write the specified type of proof.

12. flow proof

Given: $\overline{JK} \cong \overline{MK}$, $\angle N \cong \angle L$

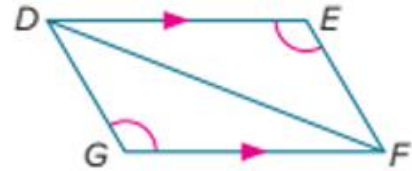
Prove: $\triangle JKN \cong \triangle MKL$



13. paragraph proof

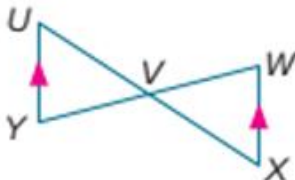
Given: $\overline{DE} \parallel \overline{FG}$, $\angle E \cong \angle G$

Prove: $\triangle DFG \cong \triangle FDE$



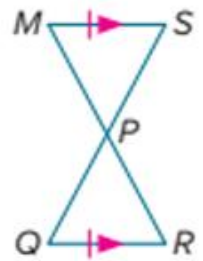
14. two-column proof

Given: V is the midpoint of $\overline{YW}$; $\overline{UY} \parallel \overline{XW}$,
Prove: $\triangle UYV \cong \triangle XWV$



15. two-column proof

Given: $\overline{MS} \cong \overline{RQ}$,
 $\overline{MS} \parallel \overline{RQ}$,
Prove: $\triangle MSP \cong \triangle RQP$

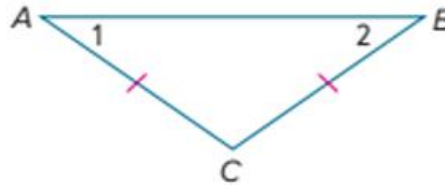


17	Solve problems involving isosceles triangles	Theorem, Ex2(5-7)	875,877-880
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Theorem 14.10: Isosceles Triangle Theorem

Words If two sides of a triangle are congruent, then the angles opposite those sides are congruent.

Example If $\overline{AC} \cong \overline{BC}$, then $\angle 2 \cong \angle 1$.



Example 2 Find Missing Measures in Isosceles Triangles

Find $m\angle B$ and $m\angle C$.

Part A Determine side relationships.

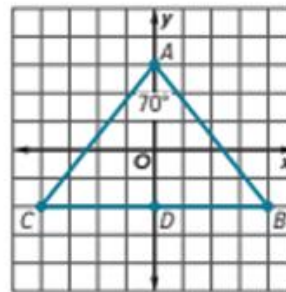
Use the Distance Formula to determine the measures of the sides of $\triangle ABC$. The coordinates of $\triangle ABC$ are $A(0, 3)$, $B(-4, -2)$, and $C(4, -2)$.

$$AB = \sqrt{[0 - (-4)]^2 + [3 - (-2)]^2} \text{ or } \sqrt{41} \text{ units}$$

$$AC = \sqrt{[0 - 4]^2 + [3 - (-2)]^2} \text{ or } \sqrt{41} \text{ units}$$

$$CB = \sqrt{[4 - (-4)]^2 + [-2 - (-2)]^2} \text{ or } 8 \text{ units}$$

So, $\triangle ABC$ is an isosceles triangle with $\overline{AB} \cong \overline{AC}$.



Part B Determine the angle measures.

Because $\overline{AB} \cong \overline{AC}$, we know that $\angle C \cong \angle B$ by the Isosceles Triangle Theorem.

$$m\angle A + m\angle B + m\angle C = 180^\circ$$

$$m\angle A + 2m\angle B = 180^\circ$$

$$70^\circ + 2m\angle B = 180^\circ$$

$$m\angle B = m\angle C = 55^\circ$$

Triangle Angle-Sum Theorem

Definition of congruent

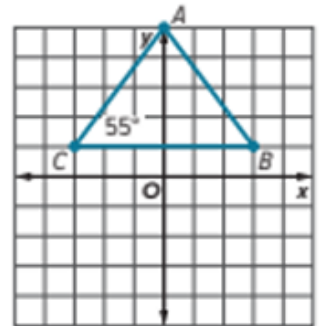
Substitute.

Solve.

Example 2

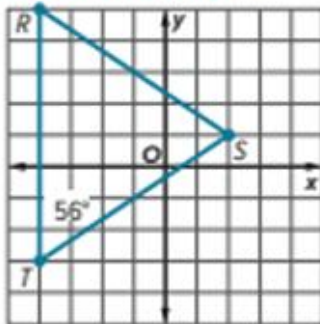
5. Refer to the figure.

- Find the measures of the sides of $\triangle ABC$. Show your work.
- Find $m\angle A$. Show your work.



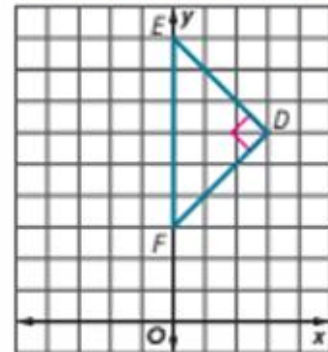
6. Find SR , ST , RT , $m\angle TRS$, and $m\angle RST$. Round to the nearest tenth, if necessary.

$SR = 7.2$ units; $ST = 7.2$ units; $RT = 8$ units;
 $m\angle TRS = 56^\circ$; $m\angle RST = 68^\circ$



7. Find the measures of $\angle DEF$ and $\angle EFD$. Round to the nearest tenth, if necessary.

$m\angle DEF = 45^\circ$ and $m\angle EFD = 45^\circ$



18	Write compound statements for conjunctions and disjunctions and determine truth values	Ex1(3,4,6)	711,717
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Example 1 Truth Values of Conjunctions

Use the statements to write a compound statement for each conjunction. Then find the truth values. Explain your reasoning.

p : The figure is a trapezoid.

q : The figure has four congruent sides.

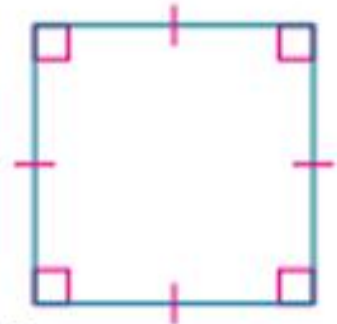
r : The figure has four right angles.

a. p and r

p and r : The figure is a trapezoid, and the figure has four right angles. Although r is true, p is false. So, p and r is false.

b. $\sim p \wedge q$

$\sim p \wedge q$: The figure is not a trapezoid, and the figure has four congruent sides. Both $\sim p$ and q are true, so $\sim p \wedge q$ is true.



19	Write compound statements for conjunctions and disjunctions and determine truth values of statements	(1,2,5)	717
----	--	---------	-----

Use the statements to write a compound statement for each conjunction or disjunction. Then find the truth values. Explain your reasoning.

$p: -3 - 2 = -5$

q : Vertical angles are congruent.

$r: 2 + 8 > 10$

1. p and q

2. $p \wedge r$

3. $q \vee \sim r$

4. $r \vee q$

5. $\sim p \wedge \sim q$

6. $\sim r \vee \sim p$

20	Use rotational symmetry to describe the rotations that carry a figure onto itself	(1-6)	829
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Determine whether each figure has a line of symmetry. If so, draw the lines of symmetry and state how many lines of symmetry it has.

1.



2.



3.



4.



5.



6.

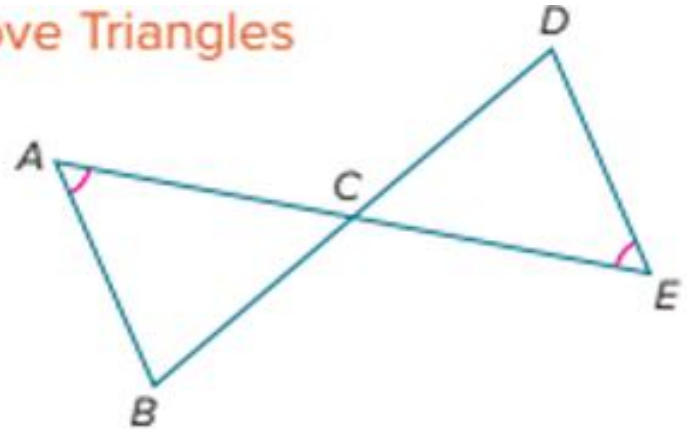


Example 1 Use ASA to Prove Triangles Congruent

Complete the two-column proof.

Given: $\angle BAC \cong \angle DEC$;
 $\overline{BD}$ bisects $\overline{AE}$.

Prove: $\triangle ACB \cong \triangle ECD$

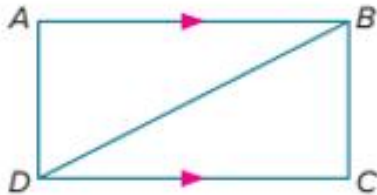


Statements	Reasons
1. $\angle BAC \cong \angle DEC$	1. Given
2. $\overline{BD}$ bisects $\overline{AE}$	2. Given
3. $\overline{AC} \cong \overline{EC}$	3. Definition of segment bisector
4. $\angle ACB \cong \angle ECD$	4. Vertical Angles Theorem
5. $\triangle ACB \cong \triangle ECD$	5. ASA

1. two-column proof

Given: $\overline{AB} \parallel \overline{CD}$, $\angle CBD \cong \angle ADB$

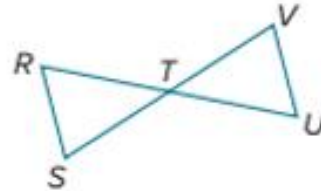
Prove: $\triangle ABD \cong \triangle CDB$



2. two-column proof

Given: $\angle S \cong \angle V$, and T is the midpoint of $\overline{SV}$.

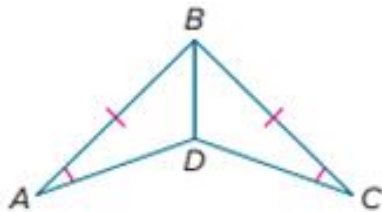
Prove: $\triangle RTS \cong \triangle UTV$



3. flow proof

Given: $\overline{AB} \cong \overline{CB}$, $\angle A \cong \angle C$, and $\overline{DB}$ bisects $\angle ABC$.

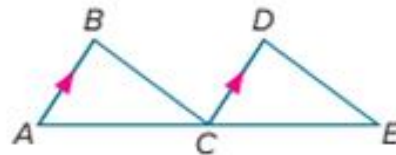
Prove: $\overline{AD} \cong \overline{CD}$



4. paragraph proof

Given: $\overline{CD}$ bisects $\overline{AE}$, $\overline{AB} \parallel \overline{CD}$, and $\angle E \cong \angle BCA$.

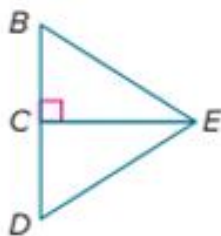
Prove: $\triangle ABC \cong \triangle CDE$



5. paragraph proof

Given: $\overline{CE}$ bisects $\angle BED$; $\angle BCE$ and $\angle ECD$ are right angles.

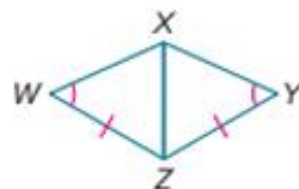
Prove: $\triangle ECB \cong \triangle ECD$



6. paragraph proof

Given: $\angle W \cong \angle Y$, $\overline{WZ} \cong \overline{YZ}$, and $\overline{XZ}$ bisects $\angle WZY$.

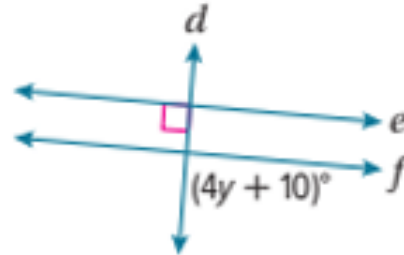
Prove: $\triangle XWZ \cong \triangle XYZ$



Example 2 Use Angle Relationships

Find the value of y so that $e \parallel f$.

From the figure, you know that line d is perpendicular to line e . For lines e and f to be parallel, line f must also be perpendicular to line d . If line f is perpendicular to line d , then $(4y + 10) = 90^\circ$. Solve for y .



$$90 = 4y + 10$$

Definition of perpendicular

$$80 = 4y$$

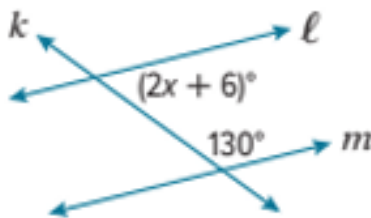
Subtract 10 from each side.

$$20 = y$$

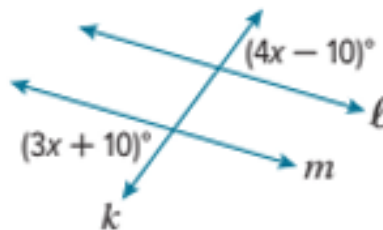
Divide each side by 4.

Find the value of x so that $\ell \parallel m$.

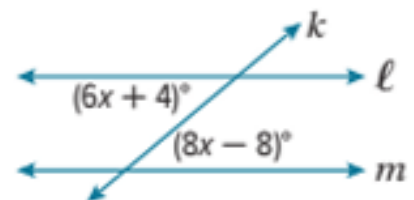
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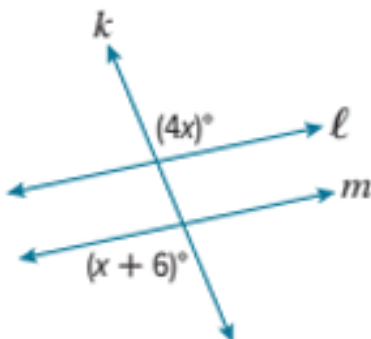
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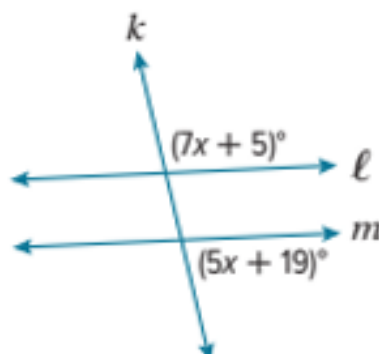
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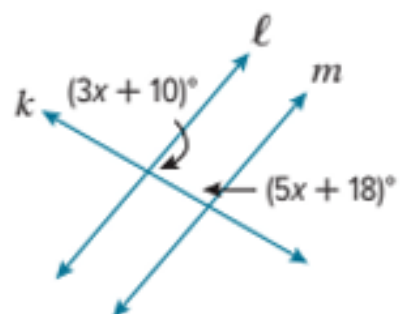
10.



11.



12.



23	Use the SSS congruence criterion for triangles to solve problems and prove relationships in geometric figures	Ex1(17-20)	855, 861
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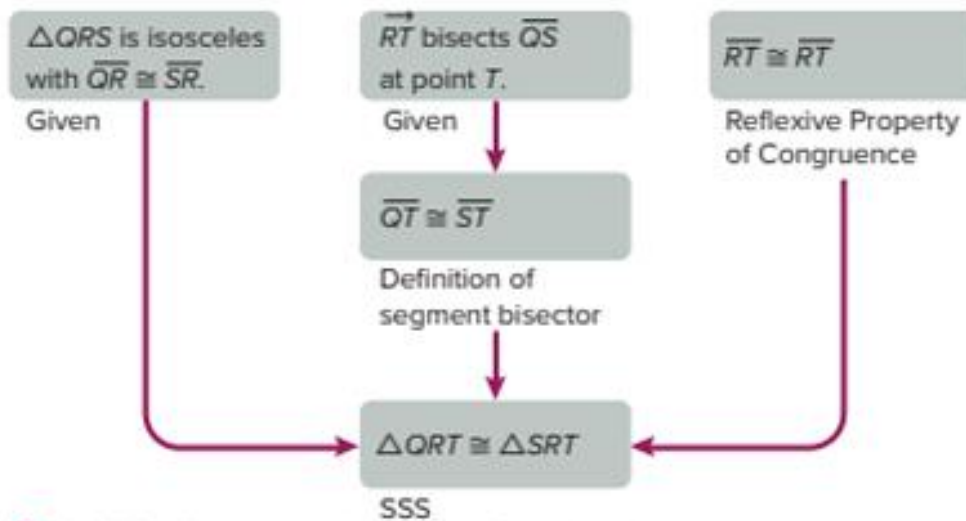
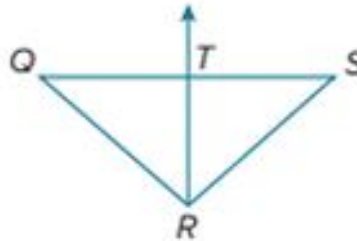
Example 1 Use SSS to Prove Triangles Congruent

Write a flow proof to show that $\triangle QRT \cong \triangle SRT$.

Given: $\triangle QRS$ is isosceles with $\overline{QR} \cong \overline{SR}$. $\overline{RT}$ bisects $\overline{QS}$ at point T .

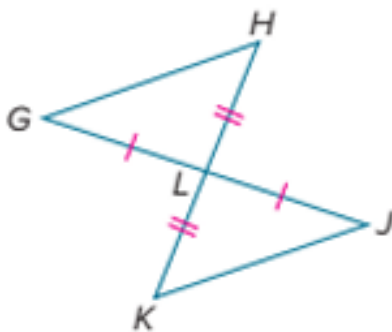
Prove: $\triangle QRT \cong \triangle SRT$

Proof:

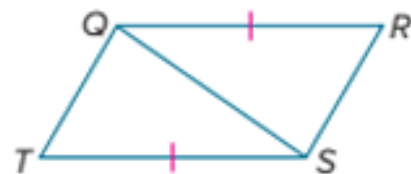


Explain whether there is enough information given in each figure to prove that the triangles are congruent using SSS or SAS.

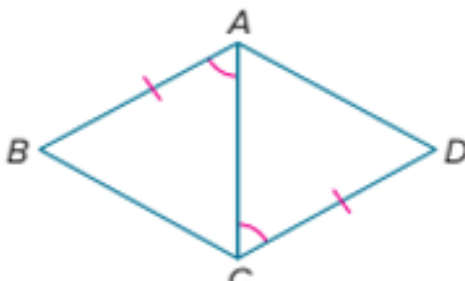
17.



18.



19.



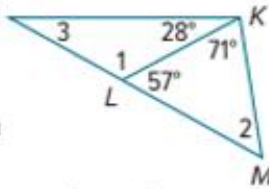
20.



24	Prove the Triangle Angle-Sum Theorem and apply the theorem to solve problems	Ex1(1-4)	839,843
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Apply Example 1 Use the Triangle Angle-Sum Theorem

Find the measure of each numbered angle. J



1 What is the task?

Describe the task in your own words. Then list any questions that you may have. How can you find answers to your questions?

Sample answer: I need to find the measures of $\angle 1$, $\angle 2$, and $\angle 3$. What are the relationships between the angle measures that are given and the angle measures that I need to find? I can use the theorems and postulates that I have learned to find the information that I need.

2 How will you approach the task? What have you learned that you can use to help you complete the task?

I will use the Triangle Angle-Sum Theorem and the definition of supplementary angles to solve for the missing angle measures.

3 What is your solution?

Use your strategy to solve the problem.

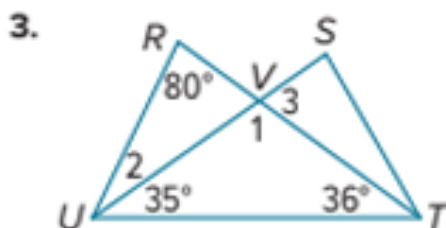
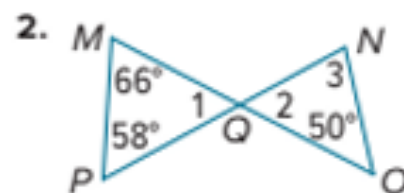
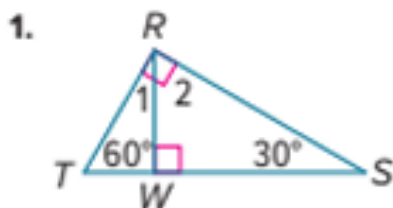
$$m\angle 1 = 123^\circ \quad m\angle 2 = 52^\circ \quad m\angle 3 = 29^\circ$$

4 How can you know that your solution is reasonable?

Write About It! Write an argument that can be used to defend your solution.

Sample answer: The sums of the measures of the interior angles of $\triangle JKL$ and $\triangle LKM$ should be 180° . When I add up the angle measures for each triangle, the sum equals 180° .

Find the measure of each numbered angle.



25	Identify hypotheses and conclusions of conditional statements and write related conditionals	Ex3(12-17)	713,717
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Example 3 Identify the Hypothesis and Conclusion

Identify the hypothesis and conclusion of each conditional statement.

- a. If a polygon has six sides, then it is a hexagon.

Hypothesis: A polygon has six sides.

Conclusion: The polygon is a hexagon.

- b. Another performance will be scheduled if the first one is sold out.

Notice that the word *if* appears in the second portion of the sentence.

Hypothesis: The first performance is sold out.

Conclusion: Another performance will be scheduled.

Identify the hypothesis and conclusion for each conditional statement. Then write each statement in if-then form.

12. Get a free water bottle with a one-year membership.
13. Everybody at the party received a gift.
14. The intersection of two planes is a line.
15. The area of a circle is πr^2 .
16. Collinear points lie on the same line.
17. A right angle measures 90 degrees.

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