Identify Pairs of Angles

● Check Understanding

Possible answers:

corresponding angles: ∠1 and ∠5, $m\angle 1 = m\angle 5 = 110°$; When parallel lines are cut by a transversal, the corresponding angles are congruent.

same-side exterior angles: ∠1 and ∠7, $m\angle 1 = 110°$, $m\angle 7 = 70°$; When parallel lines are cut by a transversal, the same-side exterior angles are supplementary.

ACTIVITY ANSWERS

Under the "congruent" label:

alternate exterior angles: ∠1 and ∠2, ∠11 and ∠12, ∠15 and ∠16

alternate interior angles: ∠3 and ∠4, ∠19 and ∠20, ∠27 and ∠28

corresponding angles: ∠7 and ∠8, ∠17 and ∠18, ∠25 and ∠26

Under the "supplementary" label:

same-side interior angles: ∠5 and ∠6, ∠9 and ∠10, ∠23 and ∠24

same-side exterior angles: ∠13 and ∠14, ∠21 and ∠22, ∠29 and ∠30

●● Check Understanding

Possible answers:

corresponding angles: ∠1 and ∠5, $m\angle 1 = m\angle 5 = 110°$; When parallel lines are cut by a transversal, corresponding angles formed are congruent.

same-side exterior angles: ∠1 and ∠7, $m\angle 1 = 110°$, $m\angle 7 = 70°$; When parallel lines are cut by a transversal, same-side exterior angles formed are supplementary.

alternate interior angles: ∠3 and ∠6, $m\angle 3 = m\angle 6 = 70°$; $m\angle 1 + m\angle 3 = 180°$, so $m\angle 3 = 70°$; $m\angle 3 = m\angle 6$ because when parallel lines are cut by a transversal, alternate interior angles formed are congruent.

ACTIVITY ANSWERS

Under the "congruent" label:

alternate exterior angles: ∠11 and ∠12, ∠15 and ∠16

alternate interior angles: ∠3 and ∠4, ∠27 and ∠28

corresponding angles: ∠17 and ∠18, ∠25 and ∠26

Under the "supplementary" label:

same-side interior angles: ∠5 and ∠6, ∠23 and ∠24

same-side exterior angles: ∠13 and ∠14, ∠21 and ∠22

Under neither label:

∠1 and ∠2, ∠7 and ∠8, ∠9 and ∠10, ∠19 and ∠20, ∠29 and ∠30

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Identify Pairs of Angles *continued*

Check Understanding

Possible answers:

corresponding angles: $\angle 1$ and $\angle 5$, $m\angle 1 = m\angle 5 = 110°$; When parallel lines are cut by a transversal, corresponding angles formed are congruent.

same-side interior angles: $\angle 4$ and $\angle 6$, $m\angle 1 = 110°$ and $m\angle 3 = 70°$, so $m\angle 4 = 110°$; $m\angle 4 + m\angle 6 = 180°$, so $m\angle 6 = 70°$; When parallel lines are cut by a transversal, same-side interior angles formed are supplementary.

alternate exterior angles: $\angle 1$ and $\angle 8$, $m\angle 1 = m\angle 8 = 110°$; When parallel lines are cut by a transversal, alternate exterior angles formed are congruent.

ACTIVITY ANSWERS

Under the "congruent" label:

alternate exterior angles: $\angle 11$ and $\angle 12$, $\angle 15$ and $\angle 16$

alternate interior angles: $\angle 3$ and $\angle 4$, $\angle 27$ and $\angle 28$

corresponding angles: $\angle 17$ and $\angle 18$, $\angle 25$ and $\angle 26$

Under the "supplementary" label:

same-side interior angles: $\angle 5$ and $\angle 6$, $\angle 23$ and $\angle 24$

same-side exterior angles: $\angle 13$ and $\angle 14$, $\angle 21$ and $\angle 22$

Under neither label:

$\angle 1$ and $\angle 2$, $\angle 7$ and $\angle 8$, $\angle 9$ and $\angle 10$, $\angle 19$ and $\angle 20$, $\angle 29$ and $\angle 30$

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Similarity Search

● Check Understanding

Yes; Possible answer: $30° + 95° + m\angle DBC = 180°$, so $m\angle DBC = 55°$. Two triangles are similar if two sets of corresponding angles are congruent, so $\triangle BCD \sim \triangle MNP$.

ACTIVITY ANSWERS

$\triangle ABC \sim \triangle QSV$;

$\triangle BDG \sim \triangle PQR$;

$\triangle BDR \sim \triangle KLM$;

$\triangle DEF \sim \triangle PRT$;

$\triangle HDM \sim \triangle XYZ$;

$\triangle GHJ \sim \triangle LNP$;

$\triangle HKM \sim \triangle VWX$;

$\triangle LJM \sim \triangle RST$;

$\triangle RVX \sim \triangle TUW$

●● Check Understanding

Yes; Possible answer: $30° + 95° + m\angle DBC = 180°$, so $m\angle DBC = 55°$. $150° + m\angle NPM = 180°$, so $m\angle NPM = 30°$. Two triangles are similar if two sets of corresponding angles are congruent, so $\triangle BCD \sim \triangle MNP$.

ACTIVITY ANSWERS

$\triangle ABC \sim \triangle QSV$;

$\triangle BDG \sim \triangle PQR$;

$\triangle BDR \sim \triangle KLM$;

$\triangle DEF \sim \triangle PRT$;

$\triangle HDM \sim \triangle XYZ$;

$\triangle GHJ \sim \triangle LNP$;

$\triangle HKM \sim \triangle VWX$;

$\triangle LJM \sim \triangle RST$;

$\triangle RVX \sim \triangle TUW$

●●● Check Understanding

Yes; Possible answer: $85° + m\angle BCD = 180°$, so $m\angle BCD = 95°$. $30° + 95° + m\angle DBC = 180°$, so $m\angle DBC = 55°$. $x + 5x = 180$, so $x = m\angle NPM = 30°$. Two triangles are similar if two sets of corresponding angles are congruent, so $\triangle BCD \sim \triangle MNP$.

ACTIVITY ANSWERS

$\triangle ABC \sim \triangle QSV$;

$\triangle BDG \sim \triangle PQR$;

$\triangle BDR \sim \triangle KLM$;

$\triangle DEF \sim \triangle PRT$;

$\triangle HDM \sim \triangle XYZ$;

$\triangle GHJ \sim \triangle LNP$;

$\triangle HKM \sim \triangle VWX$;

$\triangle LJM \sim \triangle RST$;

$\triangle RVX \sim \triangle TUW$

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Find Pythagorean Triples

● Check Understanding

Yes; Possible explanation:

$3 \times 13 = 39$

$4 \times 13 = 52$

$5 \times 13 = 65$

The numbers are multiples of the Pythagorean triple 3, 4, 5. Any multiple of a Pythagorean triple is also a Pythagorean triple.

ACTIVITY ANSWERS

Multiples of 3, 4, 5			
	3	4	5
×2	**6**	**8**	**10**
×3	**9**	**12**	**15**
×4	**12**	**16**	**20**
×5	**15**	**20**	**25**
×6	**18**	**24**	**30**
×8	**24**	**32**	**40**
×9	**27**	**36**	**45**
×12	**36**	**48**	**60**

Leg Length	Leg Length	Hypotenuse	
		Tens	Ones
3	4	0	**5**
5	12	**1**	**3**
6	8	**1**	0
7	24	**2**	**5**
9	12	**1**	**5**
10	24	**2**	**6**
12	16	**2**	0
14	48	**5**	0
15	20	**2**	**5**
18	24	**3**	0
24	32	**4**	0
27	36	**4**	**5**
36	48	**6**	0

●● Check Understanding

20, 21, 29; Possible explanation:

$20^2 + 21^2 = 29^2$

$400 + 441 = 841$

$841 = 841$

By the converse of the Pythagorean Theorem, 20, 21, and 29 are the side lengths of a right triangle. Because they are whole number side lengths of a right triangle, they are a Pythagorean triple.

$24^2 + 45^2 \neq 52^2$

$576 + 2{,}025 \neq 2{,}704$

$2{,}601 \neq 2{,}704$

24, 45, and 52 do not satisfy the Pythagorean Theorem, so they are not a Pythagorean triple.

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Find Pythagorean Triples *continued*

ACTIVITY ANSWERS

Leg Length	Leg Length	Hypotenuse	
		Tens	Ones
3	4	0	**5**
5	12	**1**	**3**
6	8	**1**	0
7	24	**2**	**5**
9	12	**1**	**5**
10	24	**2**	**6**
12	16	**2**	0
14	48	**5**	0
15	20	**2**	**5**
18	24	**3**	0
24	32	**4**	0
27	36	**4**	**5**
36	48	**6**	0

●●● Check Understanding

16, 63, 65 and 33, 56, 65; Possible explanation:

$16^2 + 63^2 = 65^2$ $\qquad$ $33^2 + 56^2 = 65^2$

$256 + 3{,}969 = 4{,}225$ $\qquad$ $1{,}089 + 3{,}136 = 4{,}225$

$4{,}225 = 4{,}225$ $\qquad$ $4{,}225 = 4{,}225$

By the converse of the Pythagorean Theorem, each set of numbers is the side lengths of a right triangle. Because they are whole number side lengths of a right triangle, they are a Pythagorean triple.

24, 45, and 52 do not satisfy the Pythagorean Theorem, so they are not a Pythagorean triple.

$24^2 + 45^2 \neq 52^2$

$576 + 2{,}025 \neq 2{,}704$

$2{,}601 \neq 2{,}704$

ACTIVITY ANSWERS

Leg Length	Leg Length	Hypotenuse	
		Tens	Ones
6	8	**1**	**0**
7	24	**2**	**5**
9	40	**4**	**1**
10	24	**2**	**6**
11	60	**6**	**1**
12	16	**2**	**0**
12	35	**3**	**7**
14	48	**5**	**0**
15	36	**3**	**9**
16	30	**3**	**4**
20	21	**2**	**9**
28	45	**5**	**3**
40	42	**5**	**8**

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