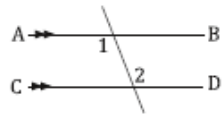


Period: Name:
Logic Problems with Parallel Lines Cut by Transversals

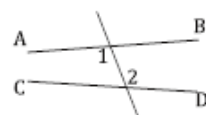
Geometry

Okay, these problems are very popular with teachers and test writers because they are supposed to be harder. They are really not if you can remember a few simple things. I'll go over what these things are, then we will practice using them on logic problems. You will no longer lose precious minutes of sleep over them. Let's go!

First, for alternate interior angles, corresponding angles, and alternate exterior angles, the lines **MUST BE PARALLEL** if they are equal in measure. They must also be parallel for consecutive angles to add to 180° . Here are a couple of pictures to illustrate this point.



In this figure $\angle 1$ and $\angle 2$ are alternate interior, and, because \overline{AB} and \overline{CD} are parallel, $m\angle 1 = m\angle 2$.

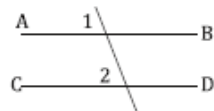


In this fig $\angle 1$ and $\angle 2$ are alternate interior, BUT, because \overline{AB} and \overline{CD} are NOT parallel, $m\angle 1 \neq m\angle 2$.

This goes for any of the above kinds of angles. Remember consecutive angles add to 180° if the lines are parallel.

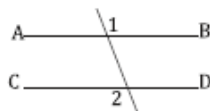
Second, and this is the weirder one, you can find out if the lines are parallel by seeing if alternate interior angles, corresponding angles, or alternate exterior angles are equal in measure. Or, if consecutive angles add to 180° . If ANY of these is true, then the lines are certainly parallel. This idea is called the converse of the first point (no not the shoes). We will talk about this fine footwear in a later section. Let's look at a few examples of this.

Ex. 1, In the figure below, $m\angle 1 = m\angle 2$. Is $AB \parallel CD$? Explain.



Answer: YES! Why? Because $m\angle 1 = m\angle 2$ and $\angle 1$ and $\angle 2$ are corresponding, the lines are parallel. This is because in order for $m\angle 1$ to equal $m\angle 2$ the lines must be parallel in the first place! (the first idea)

Ex. 2, Must $AB \parallel CD$? Explain:



Answer: NO! Why? Because we don't know if $m\angle 1 = m\angle 2$ even though $\angle 1$ and $\angle 2$ are alternate exterior; the lines don't have to be parallel, (I suppose they could be, but we don't know FOR SURE.)

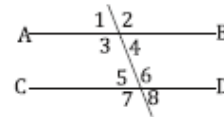
Notice that in these examples the lines look parallel. Remember, looks can be deceiving. You have to go by what the question is telling you. Don't ever say, "well it looks like it." That usually gets you into trouble in Geometry.

Thirdly, vertical angles and linear pairs are not effected by whether or not the lines are parallel, and you can't say the lines are parallel if you have either of these two. So why mention it? Because they are often used as distractors (multiple choice answers that are wrong) for these kinds of problems. Let me show you what I mean.

Page 1 front

Period: Name:

Ex. 3, In the figure below which pair of angles must be equal to show $AB \parallel CD$? Explain.

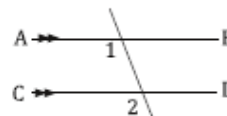


- A. 1 and 4
- B. 5 and 6
- C. 7 and 3
- D. 7 and 6

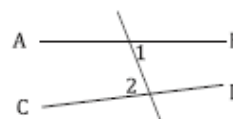
Answer: C! Why? Because A is a pair of vertical angles. If these are equal who knows if $AB \parallel CD$. Same with choice D. Choice B names a linear pair which will add to 180° whether the lines are parallel or not. So, that leaves C, a pair of corresponding angles. A, B and D are distractors.

For these, read each question. Mark "T" for True and "F" for False, and then explain your answer.

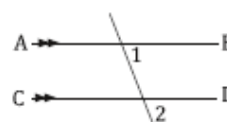
1. $m\angle 1 = m\angle 2$?



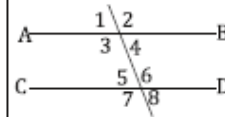
3. $m\angle 1 = m\angle 2$?



5. $m\angle 1 = m\angle 2$?



Ex. 4, In the figure below, which pair of angles must be equal to show $AB \parallel CD$? Explain.

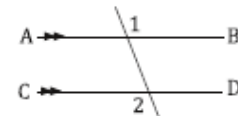


- A. 1 and 7
- B. 5 and 6
- C. 7 and 6
- D. 5 and 4

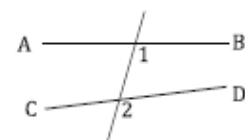
Answer: D! Why? Because A is actually a pair of supplementary angles ($m\angle 7 = m\angle 3$ and $m\angle 3 + m\angle 1 = 180^\circ$, so $m\angle 1 + m\angle 7 = 180^\circ$). B is another linear pair, and C is a pair of vertical angles. This leaves us with choice D.

Okay, now you try some for real.

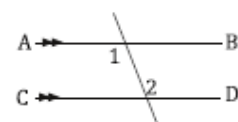
2. $m\angle 1 = m\angle 2$?



4. $m\angle 1 = m\angle 2$?



6. $m\angle 1 = m\angle 2$?



Page 1 back side

Bubble T for True and F for False.

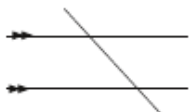
#1. <input type="radio"/> T <input type="radio"/> F	#2. <input type="radio"/> T <input type="radio"/> F	#3. <input type="radio"/> T <input type="radio"/> F	#4. <input type="radio"/> T <input type="radio"/> F	#5. <input type="radio"/> T <input type="radio"/> F	#6. <input type="radio"/> T <input type="radio"/> F
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Period: Name:
Angles Formed From Parallel Lines Cut by a Transversal

Geometry

Yes, that is a mouthful, and so is each member of this next set of angles, but with a little practice and a little persistence it's easy!

First, what the heck are Parallel Lines Cut by a Transversal? Well let's see.



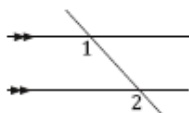
See how the parallel lines are both going the same direction? The Transversal is just an unnecessarily fancy name for that lines that intersects both of the parallel lines.

Now let's look at this...



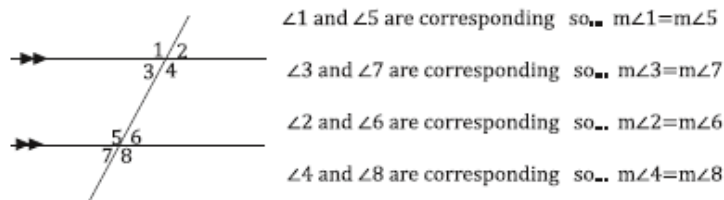
See the difference in this figure? The lines are not parallel. That's okay, all of these angles still have the same name. If the lines aren't parallel none of them are equal. Confused? As Yoda would say, "You will be." Ah, but who cares, he's just a silly green guy who lives in a swamp and has grammar problems. It's really not that bad. Let's look at the first pair of angles already...

Corresponding Angles (memorize me)

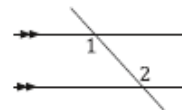


Corresponding Angle Theorem: If two parallel lines are cut by a transversal then corresponding angles are congruent and equal in measure.

If the lines aren't parallel they aren't equal; that's not so bad, huh? In your face, Yoda! No! Put me down! I didn't mean it! Okay seriously, corresponding angles are always on the same side of the transversal as each other, and on the same side of their respective parallel lines. That is how you remember them. In the previous example $\angle 1$ is below and to the left and so is $\angle 2$ so they are corresponding. Here are all of them.

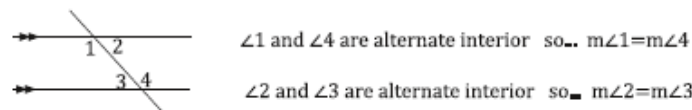


Alternate Interior Angles (memorize me)



Alternate Interior Angle Theorem: If two parallel lines are cut by a transversal then alternate interior angles are equal in measure.

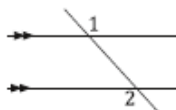
Again, if the lines aren't parallel these are not equal. Alternate means opposite. Like the alternate side of the street from where you live. To get there go across the street! Interior means inside. (How often do you see an interior decorator hanging curtains on the outside of a house? Not a good idea... trust me.) So, alternate interior means "opposite inside". Opposite, as in on opposite sides of the transversal, and inside, as in inside the parallel lines. You have to kind of stare at them a while to see what I mean, but when you see it you won't forget it. So stare away! (I'm not joking about the staring. It actually helps to stare at them until you get used to where they are.)



Also note that there are only two pairs of these things in the picture, so they are pretty easy to find.

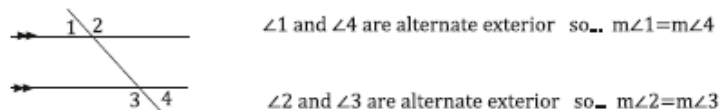
Alternate Exterior Angles (memorize me)

Can you guess where these are just by the name?



Alternate Exterior Angle Theorem: If two parallel lines are cut by a transversal, then alternate exterior angles are equal in measure.

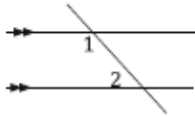
Yup, you guessed it. Exterior means outside, so these are "opposite outside" angles, as you can see if you stare again for a while...



Consecutive Angles (memorize me)

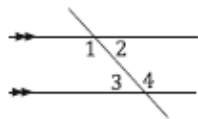
Geometry

2.1.5
P2 of 4



Consecutive Angle Theorem: If two parallel lines are cut by a transversal then the sum of the measures of consecutive angles is 180° .

Again, if the lines aren't parallel this isn't true either. This one is a bit different. These are on the same side of the transversal and on the inside of the parallel lines. They are different because they add to 180° . That is because in the following picture $\angle 2$ is actually corresponding to angle $\angle 3$ and therefore equal. You already know $\angle 2$ and $\angle 3$ are a linear pair (or at least you should). So then it follows that $\angle 1$ and angle $\angle 2$ also add to 180° . Now begin the staring!

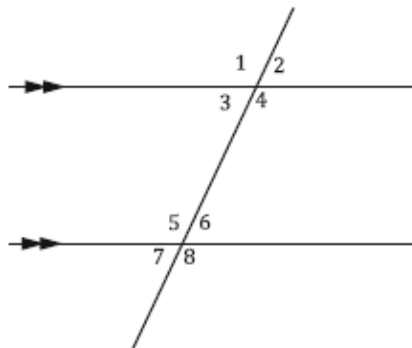


$\angle 1$ and $\angle 3$ are consecutive so $m\angle 1 + m\angle 3 = 180^\circ$

$\angle 2$ and $\angle 4$ are consecutive so $m\angle 2 + m\angle 4 = 180^\circ$

Great! So now we have corresponding, alternate interior, alternate exterior and consecutive angles. We will do a few exercises to help you memorize them. But... if you don't have a clue what they are go back and read and stare for a while longer until you do. Hey, I told you I would tell you the best way to learn this. If there was another way besides staring I would tell you. It's like you have to memorize these positions visually. For example, you can stare at a picture of your favorite person and then close your eyes and picture their face, right? It's the same thing with these angles. If you can close your eyes and picture where they all are then you're ready.

For your first set of problems, list all of the pairs of each type of angle. Refer to the instructions if you need to. (Don't feel bad about looking back. Everyone will need to on these first few problems.)



1. List all the pairs of corresponding angles:

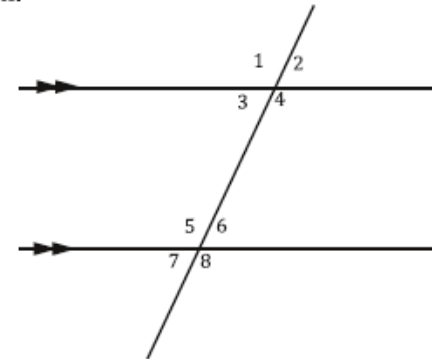
2. List all the pairs of alternate interior angles:

3. List all the pairs of alternate exterior angles:

4. List all the pairs of consecutive angles:

Period: *Name:*

For our first exercise, bubble the correct answer choice for each item below. Refer to the previous pages if you need to.



- | | | |
|--------------------------------------|-------------------------------------|-------------------------------------|
| 1. $\angle 1$ and $\angle 5$ are... | 2. $\angle 8$ and $\angle 4$ are... | 3. $\angle 2$ and $\angle 7$ are... |
| A. Corresponding | A. Corresponding | A. Corresponding |
| B. Alternate Interior | B. Alternate Interior | B. Alternate Interior |
| C. Alternate Exterior | C. Alternate Exterior | C. Alternate Exterior |
| D. Consecutive | D. Consecutive | D. Consecutive |
| 4. $\angle 3$ and $\angle 6$ are... | 5. $\angle 6$ and $\angle 4$ are... | 6. $\angle 2$ and $\angle 6$ are... |
| A. Corresponding | A. Corresponding | A. Corresponding |
| B. Alternate Interior | B. Alternate Interior | B. Alternate Interior |
| C. Alternate Exterior | C. Alternate Exterior | C. Alternate Exterior |
| D. Consecutive | D. Consecutive | D. Consecutive |
| 7. $\angle 4$ and $\angle 5$ are... | 8. $\angle 1$ and $\angle 8$ are... | 9. $\angle 3$ and $\angle 5$ are... |
| A. Corresponding | A. Corresponding | A. Corresponding |
| B. Alternate Interior | B. Alternate Interior | B. Alternate Interior |
| C. Alternate Exterior | C. Alternate Exterior | C. Alternate Exterior |
| D. Consecutive | D. Consecutive | D. Consecutive |
| 10. $\angle 4$ and $\angle 8$ are... | | |
| A. Corresponding | | |
| B. Alternate Interior | | |
| C. Alternate Exterior | | |
| D. Consecutive | | |

Great Job, these are tough to remember which is which. If you are struggling, go back and try to memorize what each one looks like. (like remembering a picture) If you do that these will become very easy. Let's do some more!

Page 1 back side

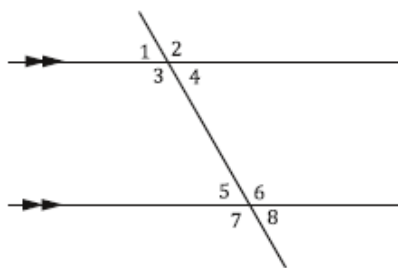
Bubble the correct answer choice from each item above.

#1.	#2.	#3.	#4.	#5.	#6.	#7.	#8.	#9.	#10.
<input type="radio"/> A.	<input type="radio"/> A.	<input type="radio"/> A.	<input type="radio"/> A.	<input type="radio"/> A.	<input type="radio"/> A.	<input type="radio"/> A.	<input type="radio"/> A.	<input type="radio"/> A.	<input type="radio"/> A.
<input type="radio"/> B.	<input type="radio"/> B.	<input type="radio"/> B.	<input type="radio"/> B.	<input type="radio"/> B.	<input type="radio"/> B.	<input type="radio"/> B.	<input type="radio"/> B.	<input type="radio"/> B.	<input type="radio"/> B.
<input type="radio"/> C.	<input type="radio"/> C.	<input type="radio"/> C.	<input type="radio"/> C.	<input type="radio"/> C.	<input type="radio"/> C.	<input type="radio"/> C.	<input type="radio"/> C.	<input type="radio"/> C.	<input type="radio"/> C.
<input type="radio"/> D.	<input type="radio"/> D.	<input type="radio"/> D.	<input type="radio"/> D.	<input type="radio"/> D.	<input type="radio"/> D.	<input type="radio"/> D.	<input type="radio"/> D.	<input type="radio"/> D.	<input type="radio"/> D.

Easy as an abelian ring!!!! Let's do some more...

For each, state the angle relationship.

Period: Name:



1. Angle $\angle 1$ and $\angle 8$ are...
alternate exterior angles

2. Angle $\angle 3$ and $\angle 5$ are...

3. Angle $\angle 1$ and $\angle 5$ are...

4. Angle $\angle 4$ and $\angle 8$ are...

5. Angle $\angle 2$ and $\angle 6$ are...

6. Angle $\angle 4$ and $\angle 5$ are...

7. Angle $\angle 2$ and $\angle 7$ are...

8. Angle $\angle 3$ and $\angle 6$ are...

9. Angle $\angle 4$ and $\angle 6$ are...

10. Angle $\angle 3$ and $\angle 7$ are...

The next set might have some from other sections! You can do it!

11. Angle $\angle 7$ and $\angle 6$ are...
vertical angles

12. Angle $\angle 5$ and $\angle 7$ are...

13. Angle $\angle 1$ and $\angle 4$ are...

14. Angle $\angle 6$ and $\angle 3$ are...

15. Angle $\angle 5$ and $\angle 6$ are...

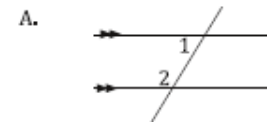
16. Angle $\angle 7$ and $\angle 8$ are...

17. Angle $\angle 7$ and $\angle 3$ are...

18. Angle $\angle 5$ and $\angle 8$ are...

Okay good, you're getting faster at it I bet. Let's do some matching. Write the letter of each picture in the right column in the blank next to its description in the left column.

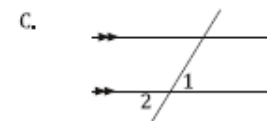
_____ 1. alternate interior angles



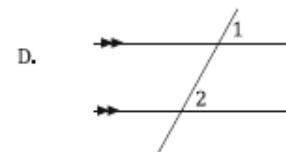
_____ 2. corresponding angles



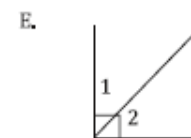
_____ 3. alternate exterior angles



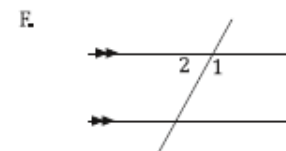
_____ 4. complementary angles



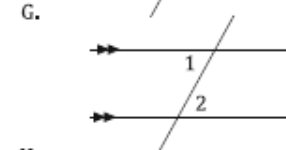
_____ 5. vertical angles



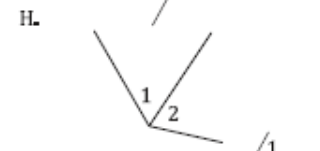
_____ 6. supplementary angles



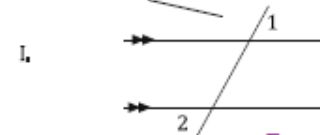
_____ 7. linear pair



_____ 8. consecutive angles



_____ 9. adjacent angles



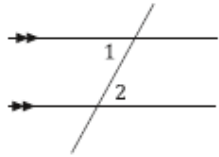
Period: Name:

2.1.5

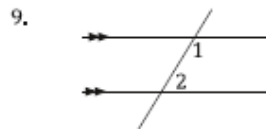
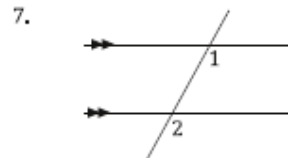
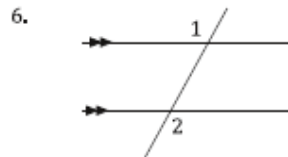
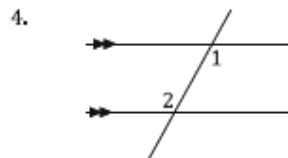
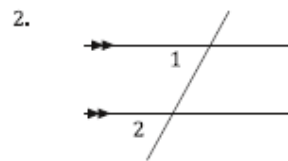
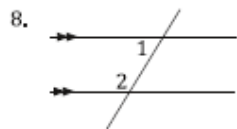
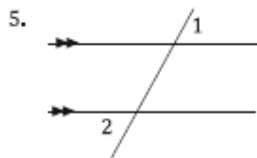
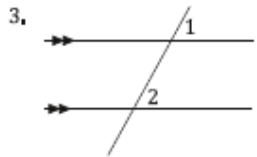
P2 of 4

Let's take it up a notch for each, write the angle relationship you see in the picture and a statement of whether the angles are equal or add to 180° .

1. This one is done for you so you know what to do.

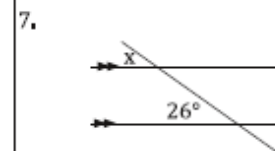
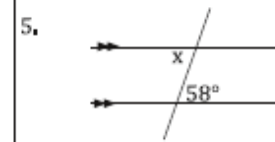
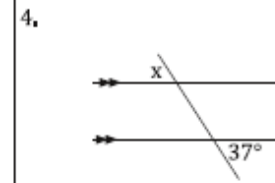
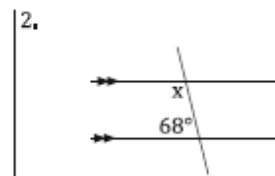
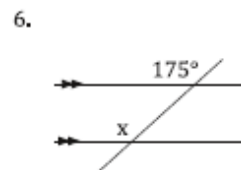
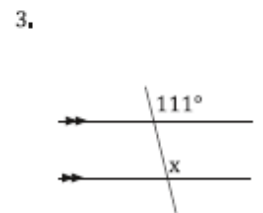
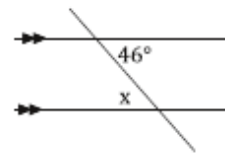


Alternate interior, $m\angle 1 = m\angle 2$



On these state the angle relationship, write a statement about whether they add to 180° or are equal, and solve for x if necessary.

1. This one is done for you so you know what to do,



Great job!!

Period: Name:

Period: Name:

Page 2 back side

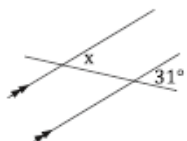
Bubble all the correct answers from above. Don't bubble incorrect answers.

- 37° 143° 69° 46° 175° 122° 58° 68° 154° 26° 64° 112° 75° 111°

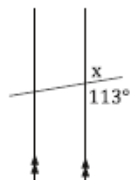
2.1.5 P2 of 4

Don't worry about these, they are just rotated.

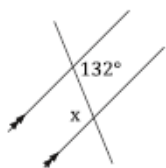
8.



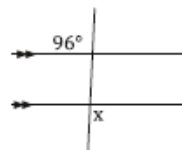
10.



12.



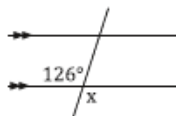
14.



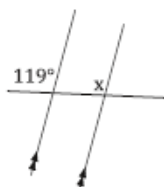
9.



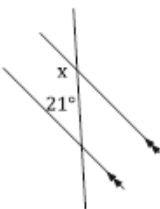
11.



13.

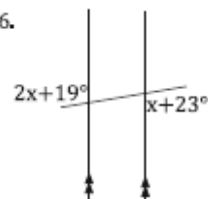


15.



On these state the angle relationship, write a statement about whether they add to 180° or are equal, and find the value of x.

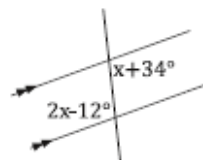
16.



Alternate exterior

$$\begin{aligned} 2x+19^\circ &= x+23^\circ \\ -x & \quad -x \\ x+19^\circ &= 23^\circ \\ -19^\circ & -19^\circ \\ x &= 4^\circ \end{aligned}$$

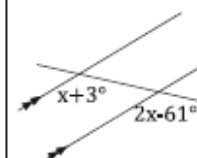
18.



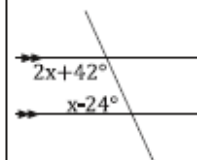
20.



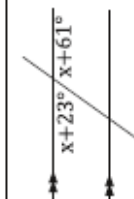
17.



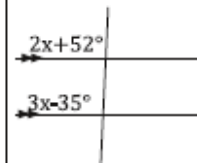
19.



21.



22.



Bubble all the correct answers from above, Don't bubble incorrect answers.

31° 132° 54° 96° 159° 122° 83° 119° 154° 113° 67° 52° 58° 126°

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Period: Name:

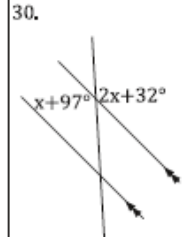
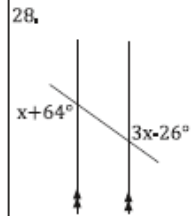
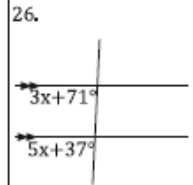
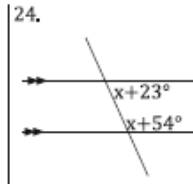
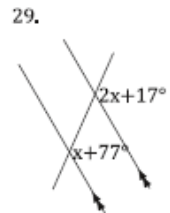
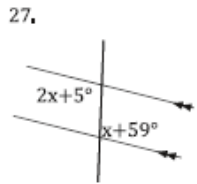
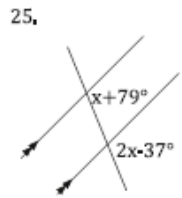
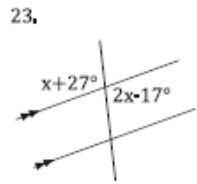
Bubble all the correct answers from above, Don't bubble incorrect answers.

72° 4° 12° 46° 18° 64° 54° 42° 30° 48° 97° 28° 87° 83°

Page 3 front

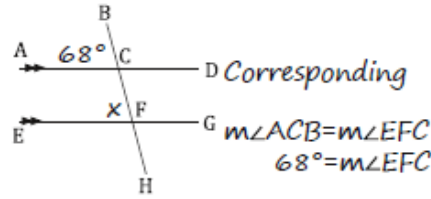
2.1.5

P2 of 4

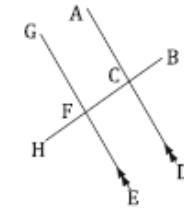


Mark the diagram with the given information, state the angle relationship, and then solve for the indicated angle.

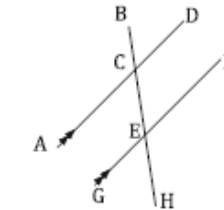
31. $m\angle ACB$ is 68° Find the $m\angle EFC$.



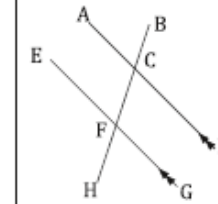
33. $m\angle EFB = 91^\circ$ Find $m\angle DCH$.



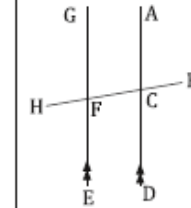
35. $m\angle GEH = 47^\circ$ Find $m\angle BEF$.



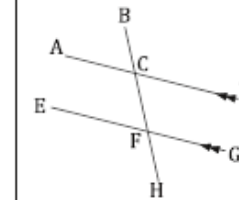
32. $m\angle DCH = 85^\circ$ Find $m\angle BFE$.



34. $m\angle HFG = 103^\circ$ Find $m\angle BCD$.



36. $m\angle DCH = 63^\circ$ Find $m\angle ACH$.



Bubble all the correct answers from above, Don't bubble incorrect answers.

- 31° 116° 20° 17° 54° 98° 51.5° 45° 60° 72.5° 65° 44° 30.5° 24°

Period: Name:

Page 3 back side

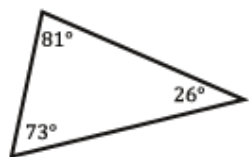
Bubble all the correct answers from above, Don't bubble incorrect answers.

- 112° 95° 91° 89° 47° 103° 63° 68° 77° 85°

Triangle Sum Theorem *Period: Name:*

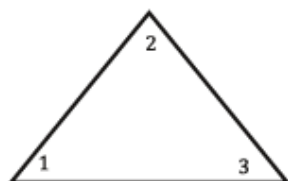
AKA: the triangle interior angle sum theorem (I know that doesn't help).

The **Triangle Sum Theorem** is really, really easy to explain. If you add all the interior (inside) angles of any triangle they always add to 180°. Why? Why do they ask for your phone number when you buy batteries at Radio Shack? I don't know; they just do. It goes like this—



$$81^\circ + 26^\circ + 73^\circ = 180^\circ$$

And like this—

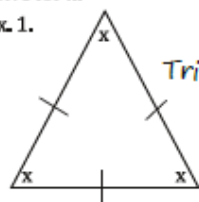


$$m\angle 1 + m\angle 2 + m\angle 3 = 180^\circ$$

A couple of reminders from our section on the basics. An equilateral triangle has 3 equal angles. So, $180^\circ/3=60^\circ$. Every angle in an equilateral triangle is 60°. They are also all the same. Look at these two examples.

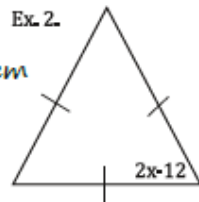
Solve for x.

Ex. 1.



$$\begin{aligned} x+x+x &= 180^\circ \\ \text{Triangle Sum Theorem} \\ \frac{3x}{3} &= \frac{180^\circ}{3} \\ x &= 60^\circ \end{aligned}$$

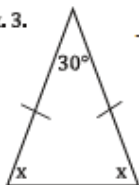
Ex. 2.



$$\begin{aligned} 2x-12 &= 60^\circ \\ \text{equilateral triangle} \\ 2x-12 &= 60^\circ \\ +12 \quad +12 & \\ 2x &= 72^\circ \\ \frac{2}{2} & \\ x &= 36^\circ \end{aligned}$$

An isosceles triangle has two equal angles. Here are a couple of examples with isosceles triangles.

Ex. 3.



$$\begin{aligned} x+x+30^\circ &= 180^\circ \\ \text{Triangle Sum Theorem} \\ 2x+30^\circ &= 180^\circ \\ -30^\circ \quad -30^\circ & \\ \frac{2x}{2} &= \frac{150^\circ}{2} \\ x &= 75^\circ \end{aligned}$$

ex 4



$$\begin{aligned} 2x-27^\circ &= x+53^\circ \\ \text{isosceles triangle} \\ 2x-27^\circ &= x+53^\circ \\ -x \quad -x & \\ x-27^\circ &= 53^\circ \\ +27^\circ \quad +27^\circ & \\ x &= 80^\circ \end{aligned}$$

Let's do a bunch of problems to turn you into a Triangle Sum Theorem expert.

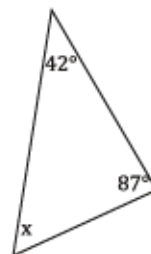
For each, find the measure of the missing angle.

1.

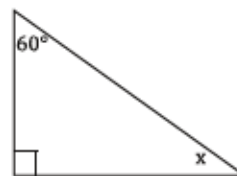


$$\begin{aligned} \text{Triangle Sum Theorem} \\ 24^\circ + 88^\circ + x &= 180^\circ \\ 112^\circ + x &= 180^\circ \\ -112^\circ \quad -112^\circ & \\ x &= 68^\circ \end{aligned}$$

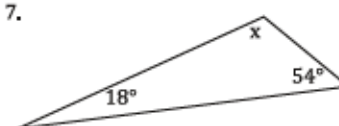
3.



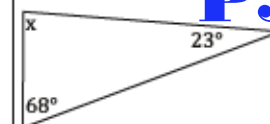
5.



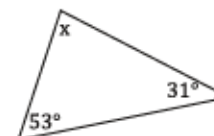
7.



2.



4.



6.

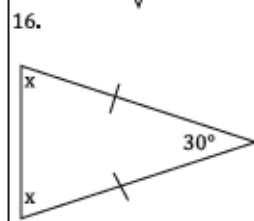
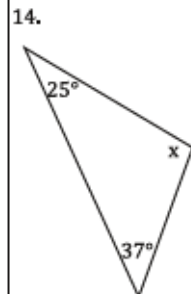
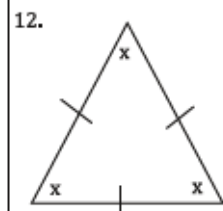
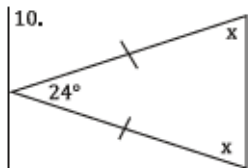
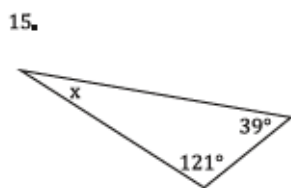
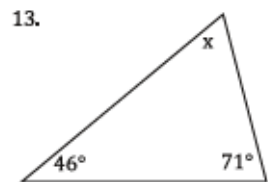
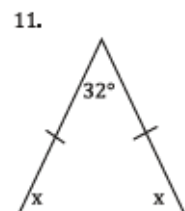
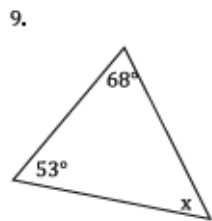


8.



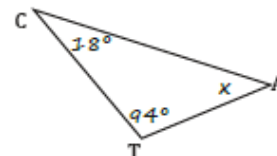
Bubble all the correct answers from above. Don't bubble incorrect answers.

- 68° 271° 96° 30° 120° 108° 139° 15° 129° 231° 34° 89° 51° 54°



Mark the diagram with the given information. Then, find the measure of the indicated angle.

17. $m\angle C=18^\circ$, $m\angle T=94^\circ$. Find $m\angle A$.



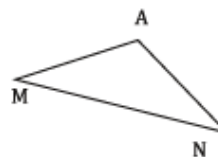
Triangle Sum Theorem

$$18^\circ + 94^\circ + x = 180^\circ$$

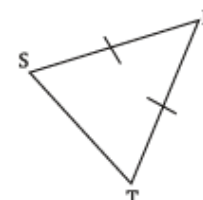
$$112^\circ + x = 180^\circ$$

$$-112^\circ \quad -112^\circ \quad x = 68^\circ \quad m\angle A = 68^\circ$$

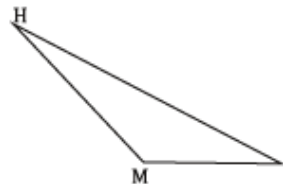
19. $m\angle A=138^\circ$, $m\angle N=17^\circ$. Find $m\angle M$.



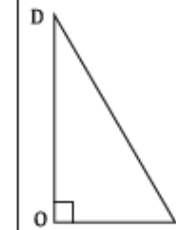
21. $m\angle I=48^\circ$, Find $m\angle T$.



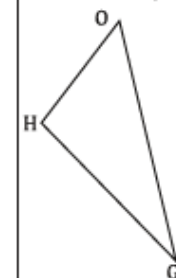
23. $m\angle H=13^\circ$, $m\angle I=24^\circ$. Find $m\angle M$.



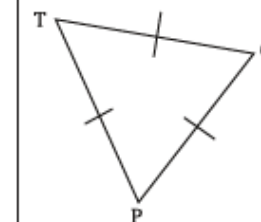
18. $m\angle D=30^\circ$, $m\angle O=90^\circ$, Find $m\angle G$.



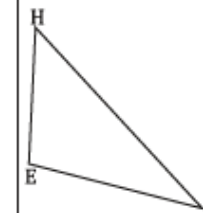
20. $m\angle O=47^\circ$, $m\angle G=43^\circ$. Find $m\angle H$.



22. Find $m\angle O$, $m\angle T$, and $m\angle P$.



24. $m\angle E=118^\circ$, $m\angle R=26^\circ$, Find $m\angle H$.



Period: Name:

Page 1 back side

Bubble all the correct answers from above. Don't bubble incorrect answers.

- 30° 75° 20° 118° 78° 148° 74° 150° 60° 64° 65° 63° 21° 359°

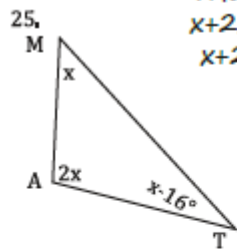
Bubble all the correct answers from above. Don't bubble incorrect answers.

- 68° 112° 66° 132° 143° 37° 36° 20° 60° 90° 60° 30° 25° 120°

2.1.4

P3 of 4

Solve for x.



Triangle Sum Theorem

$$x+2x+(x-16^\circ)=180^\circ$$

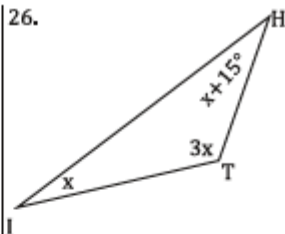
$$x+2x+x-16^\circ=180^\circ$$

$$4x-16^\circ=180^\circ$$

$$+16^\circ \quad +16^\circ$$

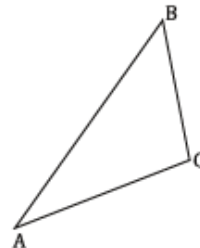
$$\frac{4x=196^\circ}{4 \quad 4}$$

$$x=49^\circ$$

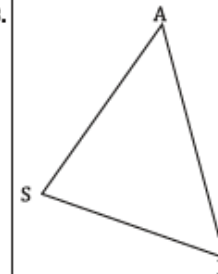


Mark the diagram with the given information. Then, find the measure of the indicated angle.

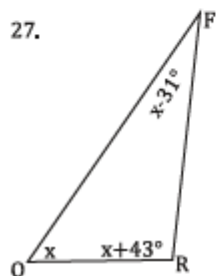
31. $m\angle A=x$, $m\angle B=2x$, $m\angle C=2x+30^\circ$. Find $m\angle B$.



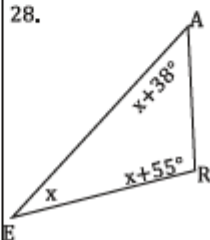
32. $m\angle S=2x$, $m\angle A=x-23$, $m\angle D=x-17^\circ$. Find $m\angle S$.



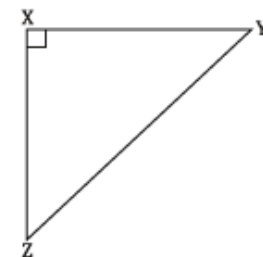
27.



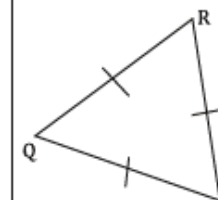
28.



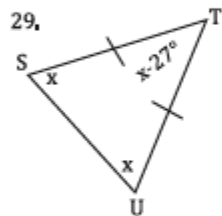
33. $m\angle Y=x+5^\circ$, $m\angle Z=x-7^\circ$. Find $m\angle Z$.



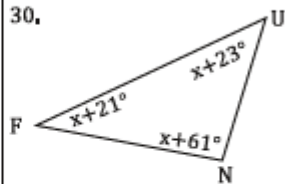
34. Find $m\angle R$, $m\angle Q$, and $m\angle S$.



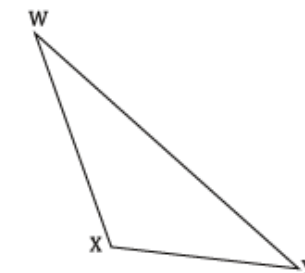
29.



30.



35. $m\angle W=x-22^\circ$, $m\angle X=3x+19^\circ$, $m\angle Y=x-17^\circ$. Find $m\angle X$.



Period: _____ Name: _____

Bubble all the correct answers from above. Don't bubble incorrect answers.

- 165°
 25°
 69°
 27°
 29°
 55°
 56°
 39°
 33°
 49°

Bubble all the correct answers from above. Don't bubble incorrect answers.

- 39°
 60°
 139°
 60°
 110°
 55°
 50°
 46°
 31°
 92°
 40°

