



7th
Basic

8th
Advanced

Helping With Math

USA
GRADES

Adjacent Angles

*Suitable for students
aged 11-13*



This pack is suitable for learners aged 11-13 years old or 7th to 8th grades (USA). The content covers fact files and relevant basic and advanced activities involving adjacent angles.

Mardi Gras!



Mardi Gras is traditionally celebrated on the Tuesday before Ash Wednesday and the start of Lent. It is called “Fat Tuesday” in French. This is also a Christian holiday that can be traced back to pagan spring and fertility celebrations for hundreds of years.

- Mardi Gras 2022 will fall on Tuesday, March 1.
- Celebrations in New Orleans will push through.



The celebration in New Orleans involves beads, masks, and carnival.



ANGLES

In geometry, an angle can be defined as the figure formed by two rays meeting at a common endpoint called a vertex. Angle measures the amount of turn of its rays in degrees.



TYPES OF ANGLES

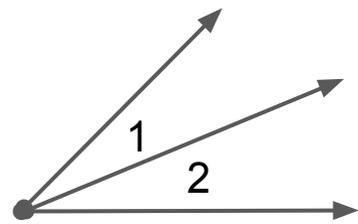
Acute Angles	angles which measure less than 90°
Right Angles	angles which measure exactly 90°
Obtuse Angles	angles which measure greater than 90° but less than 180°
Straight Angles	angles which measure exactly 180°
Reflex Angles	angles which measure greater than 180° but less than 360°

Remember:

A full rotation is an angle which measures exactly 360° .

ADJACENT ANGLES

Adjacent angles are a pair of angles with a common side (arm) and a common vertex (corner point) and do not overlap in any way. In other words, they are next to each other.



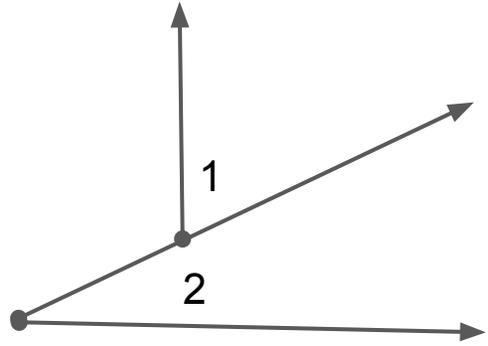
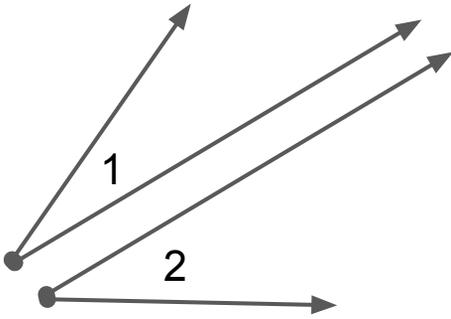
$\angle 1$ and $\angle 2$ are **adjacent** angles.

OTHER PROPERTIES OF ADJACENT ANGLES

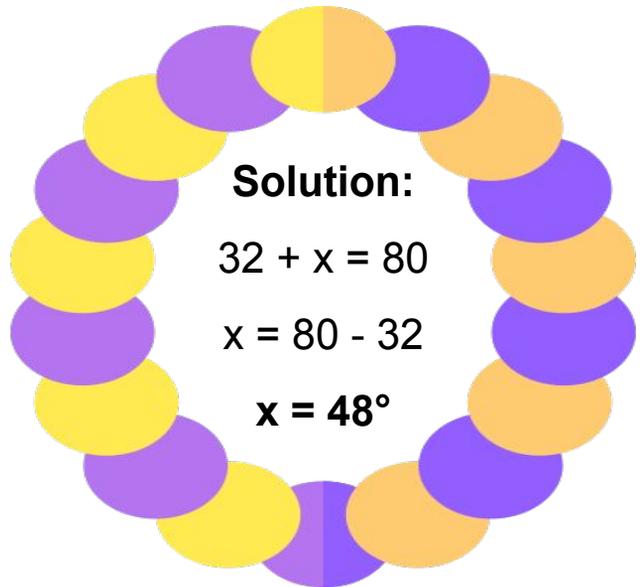
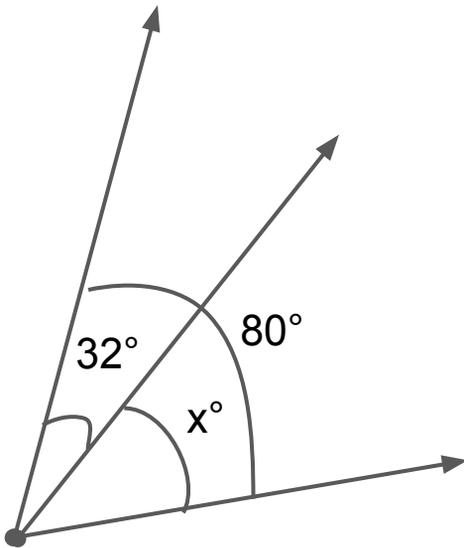
- They have a non-common side on both sides of the common side or arm (shared in the center)
- They can be supplementary or complementary angles.



NON-ADJACENT ANGLES



ILLUSTRATIVE EXAMPLE



PRACTICE EXERCISE

- 1.) If $\angle ADB = 87^\circ$ and $\angle BDC = 35^\circ$, what is the measurement of $\angle ADC$?
 $\angle ADC = \underline{\hspace{2cm}}$
- 2.) If $\angle BCD = 41^\circ$ and $\angle ADC = 78^\circ$, what is the measurement of $\angle ADB$?
 $\angle ADB = \underline{\hspace{2cm}}$

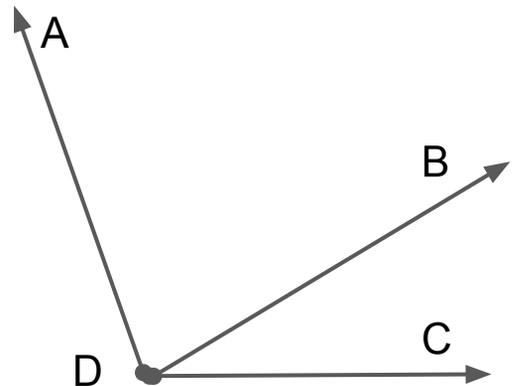


TABLE OF ACTIVITIES

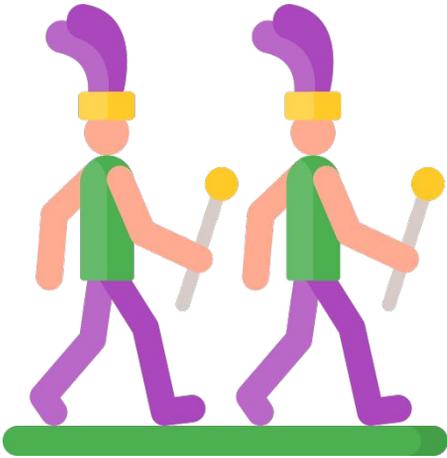
Ages 11-12 (Basic)		7th Grade
1	Mardi Gras Glossary	
2	Mardi Gras Crown	
3	Get Masked!	
4	Jester Hat	
5	Mardi Gras Countries	
Ages 12-13 (Advanced)		8th Grade
6	Mardi Gras Parade Route	
7	Mardi Gras' Big Fan	
8	Purple, Green, and Gold Bracelet	
9	Countdown To Mardi Gras	
10	Free Entrance To Mardi Gras Carnival	



MARDI GRAS GLOSSARY

G7
Basic

Mardi Gras is not just an event but it is a culture with a vocabulary of its own that you might hear common in a parade. While learning the Mardi Gras glossary, let's identify whether these statements are true by writing TRUE. Otherwise, correct it.



1. An angle which measures exactly 180° is a straight angle.

2. If the angle measures 126° , it is an acute angle.

3. An angle which measures less than 90° is a reflex angle.

4. An angle which measures exactly 90° is a right angle.

5. Adjacent angles share a common side and a common vertex.

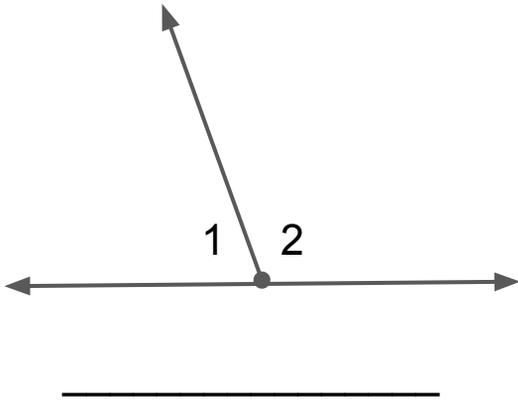


MARDI GRAS CROWN

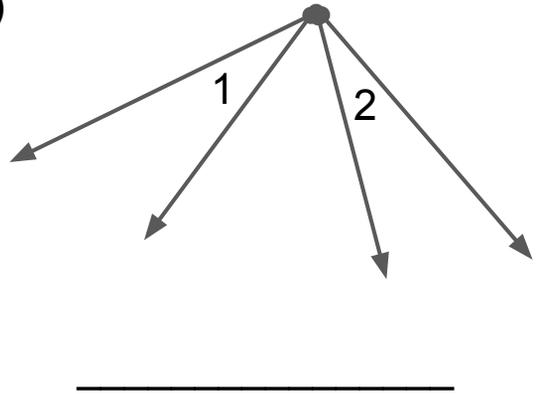
G7
Basic

Anne's school is having a Mardi Gras Crown competition. They should only use sticks to design it and use the concept of adjacent angles. Help Anne to identify which angle pairs are adjacent or not by writing A for adjacent and NA for non-adjacent.

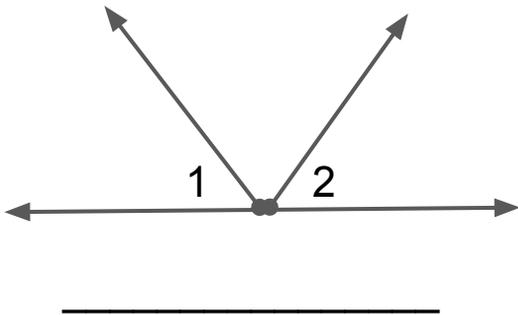
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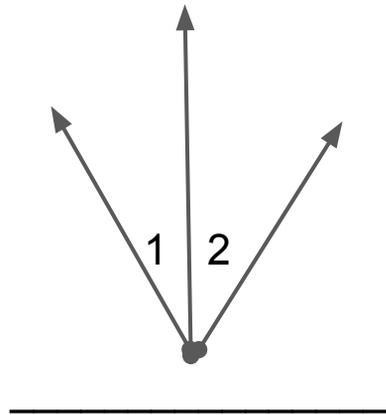
2.)



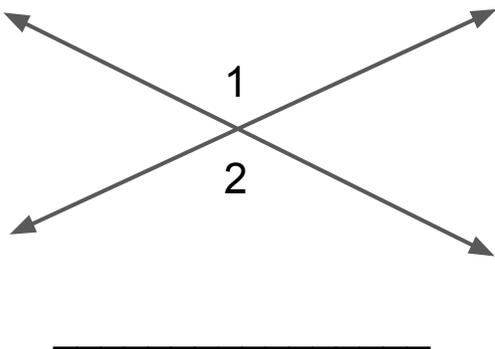
3.)



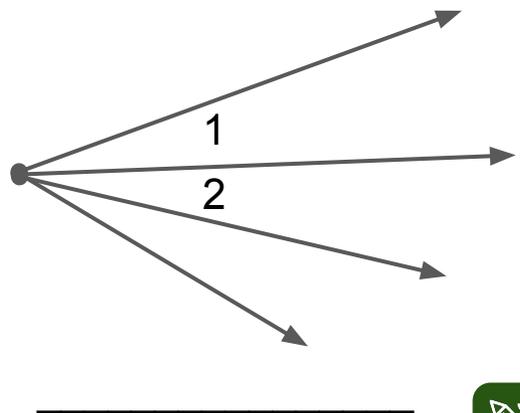
4.)



5.)



6.)

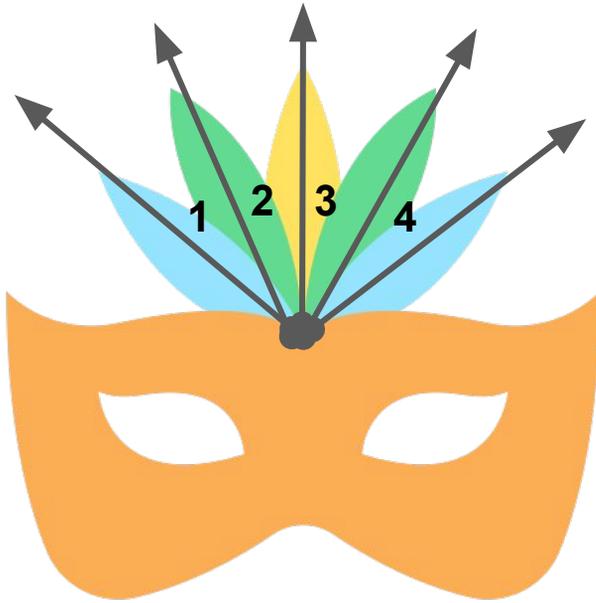


GET MASKED!

G7
Basic

Andrea is making a mask for the Mardi Gras Parade. The mask is surrounded by feathers and other decorations like rhinestones and sequins. Identify all possible pairs of adjacent and non-adjacent angles in each design that Andrea made for herself.

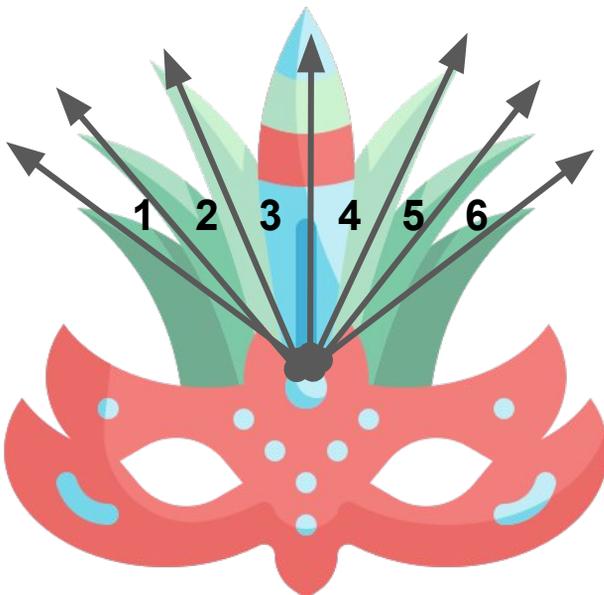
1.)



Adjacent Angles:

Non-Adjacent Angles:

2.)



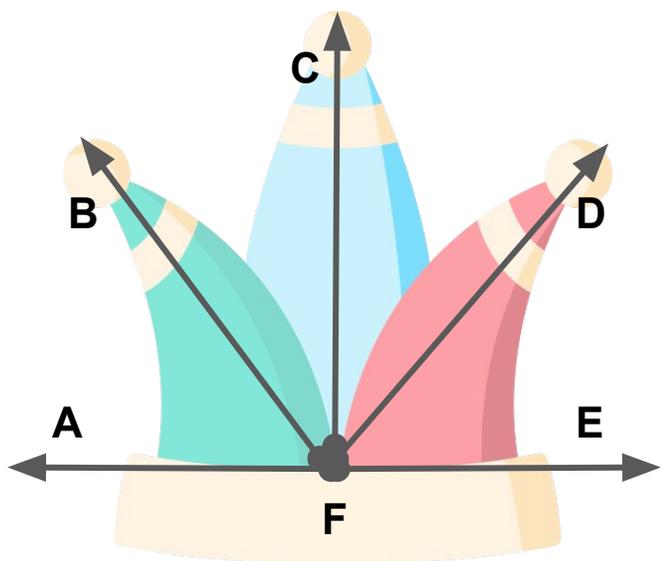
Adjacent Angles:



JESTER HAT

G7
Basic

Part of the Mardi Gras outfit is wearing a Jester Hat. A Jester Hat is floppy with three points, each of which has a single bell at the end. Get this free Jester Hat by answering all the questions below.



Answers:

1. _____
2. _____
3. _____
4. _____
5. _____

- 1.) Which side is common to $\angle BFA$ and $\angle CFB$?
A. side AF B. side BF C. side CF D. None
- 2.) Which angle is adjacent to $\angle DFC$?
A. $\angle DFE$ B. $\angle BFA$ C. $\angle BFE$ D. None
- 3.) Which is not adjacent to $\angle BFC$?
A. $\angle CFD$ B. $\angle BFA$ C. $\angle DFE$ D. None
- 4.) If $m\angle BFA = 59^\circ$ and $\angle AFE$ is a straight angle, what is $m\angle BFE$?
A. 59° B. 121° C. 31° D. Not possible
- 5.) If $m\angle CFD = 49^\circ$ and $m\angle CFE = 88^\circ$, what is $m\angle DFE$?
A. 49° B. 137° C. 39° D. 29°

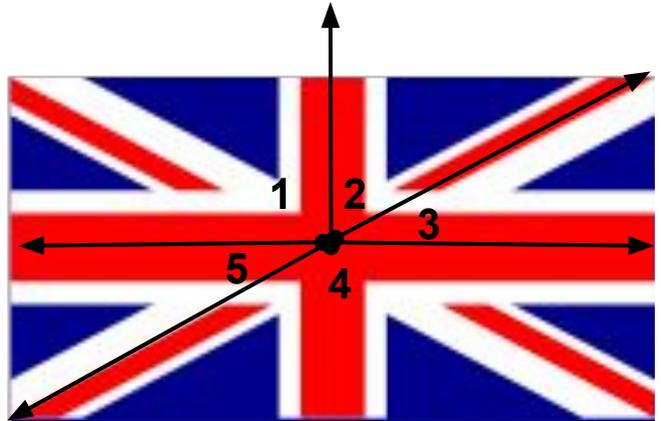
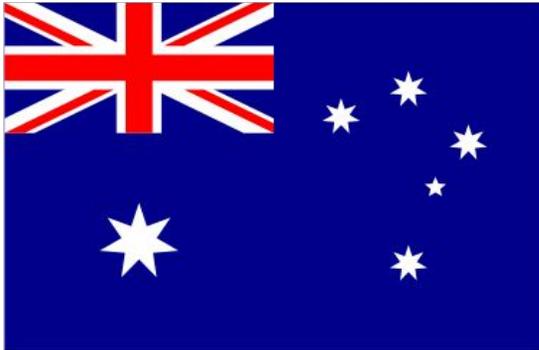


MARDI GRAS COUNTRIES

G7
Basic

Aside from the Mardi Gras in New Orleans, other countries also have their celebration. Find out what countries also celebrate Mardi Gras by answering the questions below.

Australia

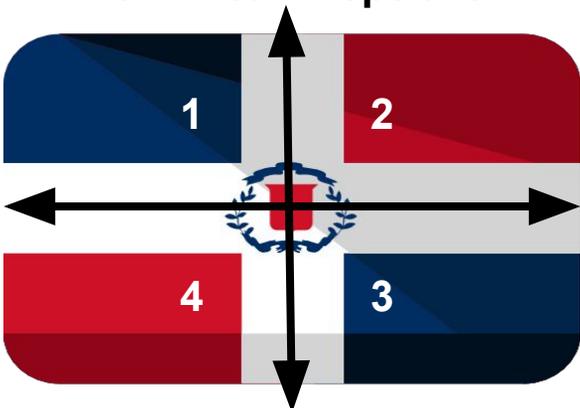


1.) Name all possible pairs of adjacent angles.

2.) Name all possible pairs of non-adjacent angles.

3.) If $\angle 2 = 44^\circ$ and $m\angle 3 = 46^\circ$, what angle is formed by the sum of $\angle 2$ and $\angle 3$? _____

Dominican Republic



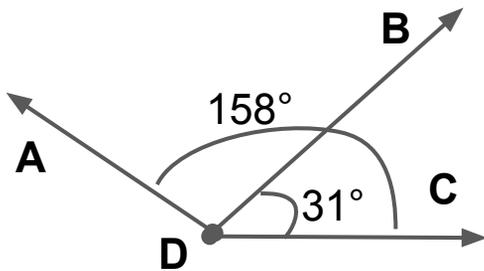
4.) What can you say about the adjacent pairs in the given figure? What lines are they?



MARDI GRAS PARADE ROUTE

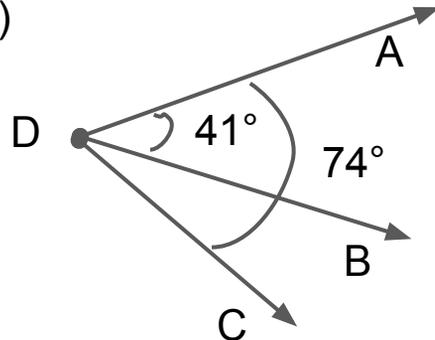
The Mardi Gras parade route will pass through crossroads. The roads that meet at crossroads form angles. Consider the lines below as roads with a common endpoint where the parade will pass by. Find the measurement of the missing angles.

1.)



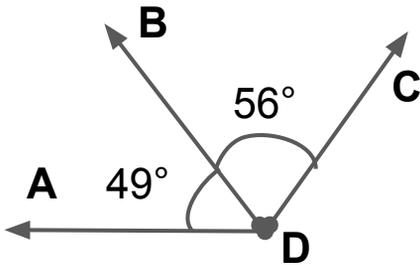
$m\angle ADB = \underline{\hspace{2cm}}$

2.)



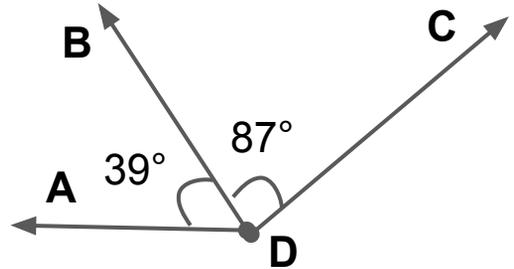
$m\angle BDC = \underline{\hspace{2cm}}$

3.)



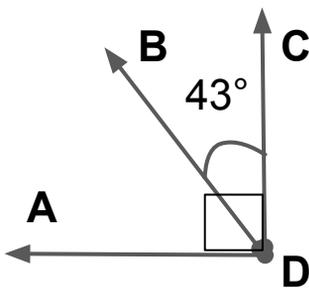
$m\angle ADC = \underline{\hspace{2cm}}$

4.)

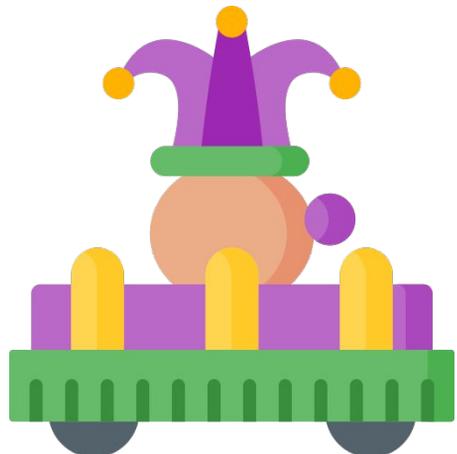


$m\angle ADC = \underline{\hspace{2cm}}$

5.)



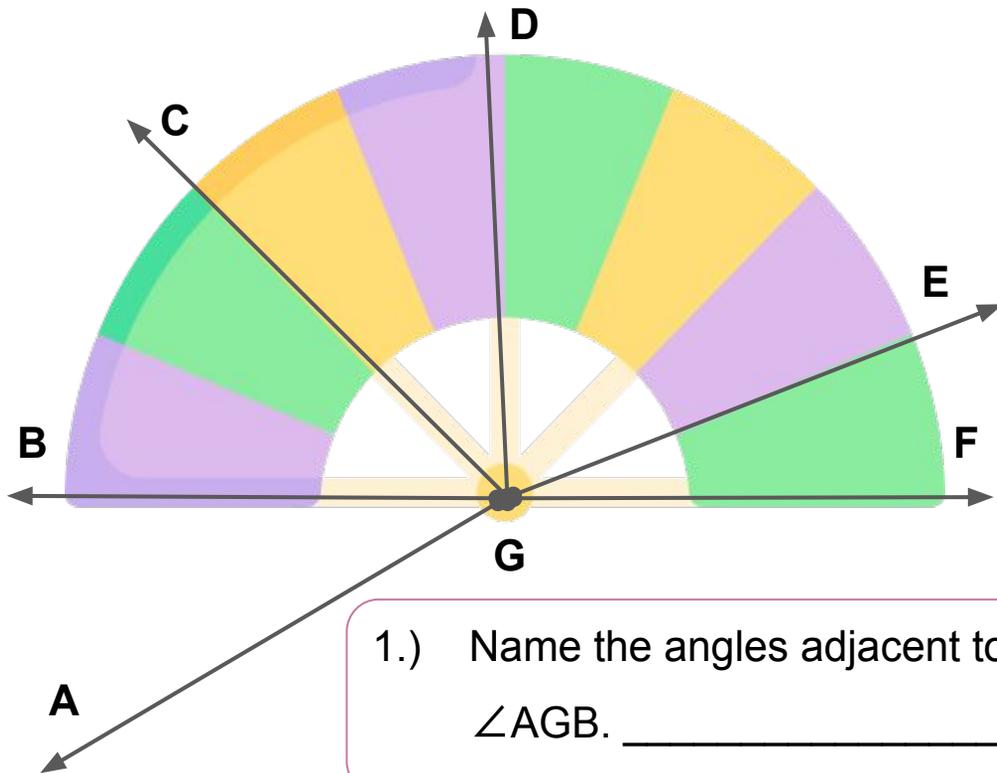
$m\angle BDA = \underline{\hspace{2cm}}$



MARDI GRAS' BIG FAN

G8
Advanced

Refer to this Mardi Gras big fan to name the adjacent angles present below. Use your understanding of these angles to solve for the unknown measure.



1.) Name the angles adjacent to $\angle AGB$. _____

2.) If $m\angle DGB = 87^\circ$ and $m\angle CGB = 45^\circ$, find $m\angle DGC$.

3.) Find $m\angle EGA$, if $m\angle EGF = 27^\circ$ and $m\angle FGA = 135^\circ$.

4.) Find $m\angle DGE$, if $m\angle CGD = 41^\circ$ and $m\angle CGE = 130^\circ$.

5.) If $m\angle BGE = 155^\circ$, find $m\angle EGF$. _____

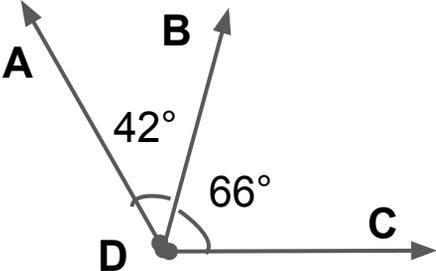


PURPLE, GREEN, AND GOLD BRACELET

G8
Advanced

John's school organized a school fair with Mardi Gras as its theme. One of the booths will be giving free bracelets according to the item and number of correct answers to the questions below. Let's see if John can get free Mardi Gras bracelets.

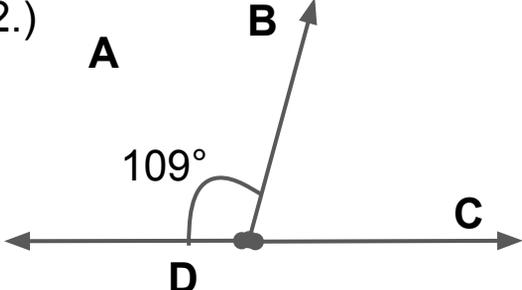
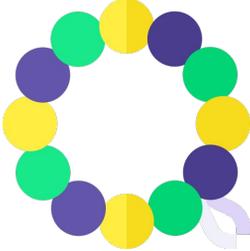
1.)




$m\angle ADC = (x + 18)^\circ$

$x = \underline{\hspace{2cm}}$

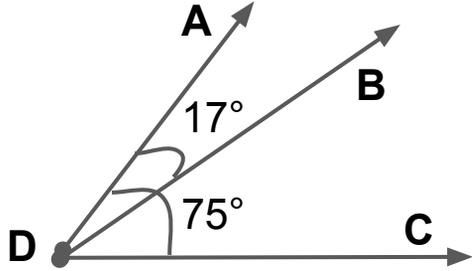
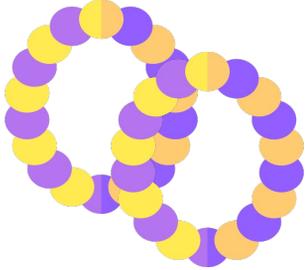
2.)

$m\angle BDC = (2x + 5)^\circ$

$x = \underline{\hspace{2cm}}$

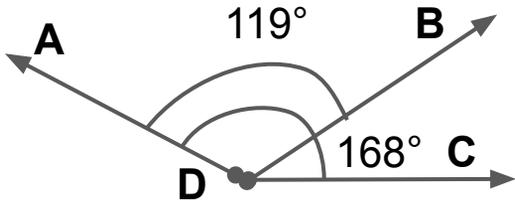
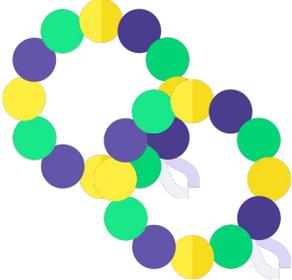
3.)

$m\angle BDC = (x - 6)^\circ$

$x = \underline{\hspace{2cm}}$

4.)

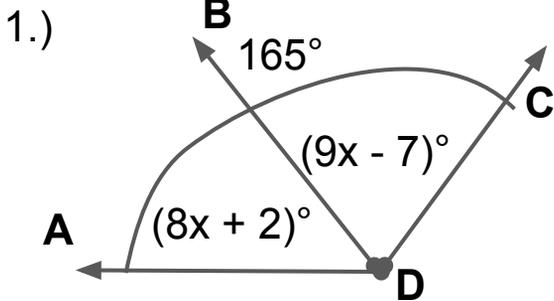
$m\angle BDC = (9 + x)^\circ$

$x = \underline{\hspace{2cm}}$

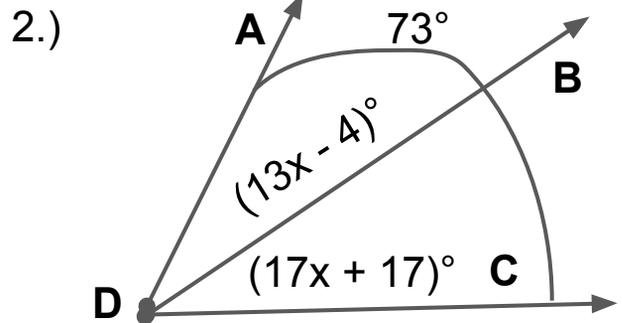


COUNTDOWN TO MARDI GRAS

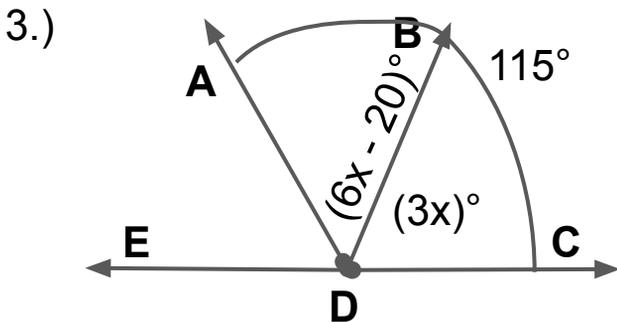
Everybody's looking forward to the yearly celebration of Mardi Gras. They even do a countdown before midnight. Let us look at the hands' clock movement as they create pairs of adjacent angles and answer the missing angles.



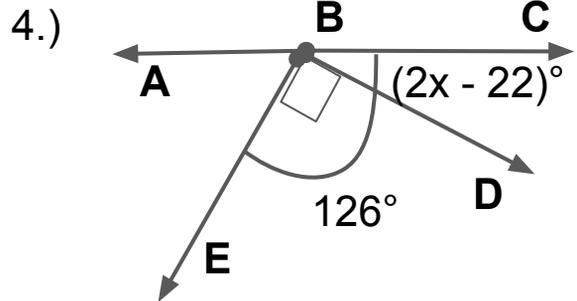
$x =$ _____
 $m\angle ADB =$ _____
 $m\angle BDC =$ _____



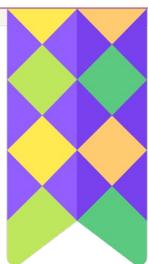
$x =$ _____
 $m\angle ADB =$ _____
 $m\angle BDC =$ _____



$x =$ _____
 $m\angle ADB =$ _____
 $m\angle BDC =$ _____



$x =$ _____
 $m\angle CBD =$ _____
 $m\angle BDE =$ _____



FREE ENTRANCE TO MARDI GRAS CARNIVAL

G8
Advanced

Before going home John's family decided to go to the Mardi Gras Carnival. To get free entrance tickets, they have to answer the questions below. Help them get free entrance tickets!

- 1.) What are complementary and supplementary angles?
Why are they sometimes considered adjacent angles?



- 2.) Is it possible that a pair of angles are both vertical and adjacent at the same time? Why or why not?



ANSWER GUIDE

Activity 1

1.) True 2.) obtuse 3.) acute 4.) True 5.) True

Activity 2

1.) A 2.) NA 3.) NA 4.) A 5.) NA 6.) A

Activity 3

1.) Adjacent Angles Non-Adjacent Angles
 $\angle 1$ and $\angle 2$ $\angle 1$ and $\angle 3$
 $\angle 2$ and $\angle 3$ $\angle 1$ and $\angle 4$
 $\angle 3$ and $\angle 4$ $\angle 2$ and $\angle 4$

2.) Adjacent Angles
 $\angle 1$ and $\angle 2$ $\angle 4$ and $\angle 5$
 $\angle 2$ and $\angle 3$ $\angle 5$ and $\angle 6$
 $\angle 3$ and $\angle 4$

Activity 4

1.) B 2.) A 3.) C 4.) B 5.) D

Activity 5

1.) $\angle 1$ and $\angle 2$, $\angle 2$ and $\angle 3$, $\angle 3$ and $\angle 4$, $\angle 4$ and $\angle 5$
2.) $\angle 1$ and $\angle 3$, $\angle 1$ and $\angle 4$, $\angle 2$ and $\angle 4$, $\angle 2$ and $\angle 5$, $\angle 3$ and $\angle 5$
3.) Right angle
4.) Answers may vary (perpendicular lines).



ANSWER GUIDE

Activity 6

1.) 127° 2.) 33° 3.) 105° 4.) 126° 5.) 47°

Activity 7

1.) $\angle BGC$ and $\angle FGA$ 3.) 162° 5.) 25°
2.) 42° 4.) 89°

Activity 8

1.) 90 2.) 33 3.) 64 4.) 40

Activity 9

1.) $x = 10$ $m\angle ADB = 82^\circ$ $m\angle BDC = 83^\circ$	2.) $x = 3$ $m\angle ADB = 35^\circ$ $m\angle BDC = 38^\circ$
3.) $x = 15$ $m\angle ADB = 70^\circ$ $m\angle BDC = 45^\circ$	4.) $x = 29$ $m\angle CBD = 36^\circ$ $m\angle BDE = 90^\circ$

Activity 10

1.) Complementary – angles with a sum of 90°
Supplementary – angles with a sum of 180°
Answers may vary on the explanation.

2.) Answers may vary.



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