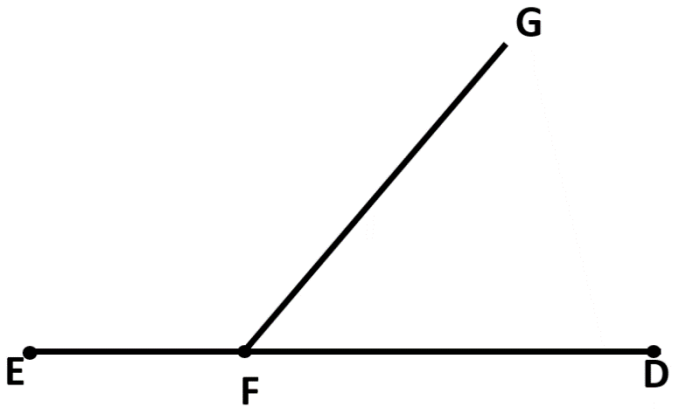
GRADE 8

Geometry of straight lines

Investigation 1

Let's investigate angles on a straight line

1.1)



What size is $D\hat{F}G$? _____

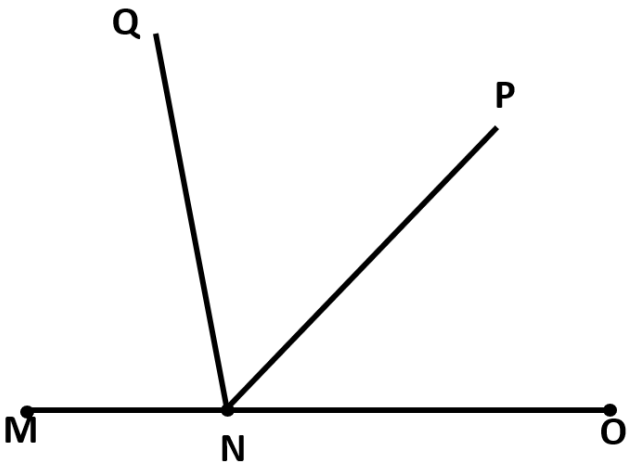
What size is $E\hat{F}G$? _____

What is the sum of $D\hat{F}G + E\hat{F}G$?

_____

_____

1.2)



What size is $O\hat{N}P$? _____

What size is $P\hat{N}Q$? _____

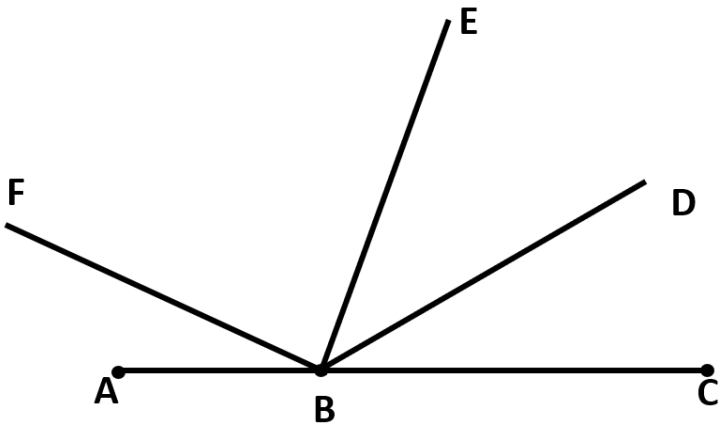
What size is $M\hat{N}Q$? _____

What is the sum of $O\hat{N}P + O\hat{N}Q + M\hat{N}Q$?

_____

_____

1.3)



What size is $C\hat{B}D$? _____

What size is $D\hat{B}E$? _____

What size is $E\hat{B}F$? _____

What size is $A\hat{B}F$? _____

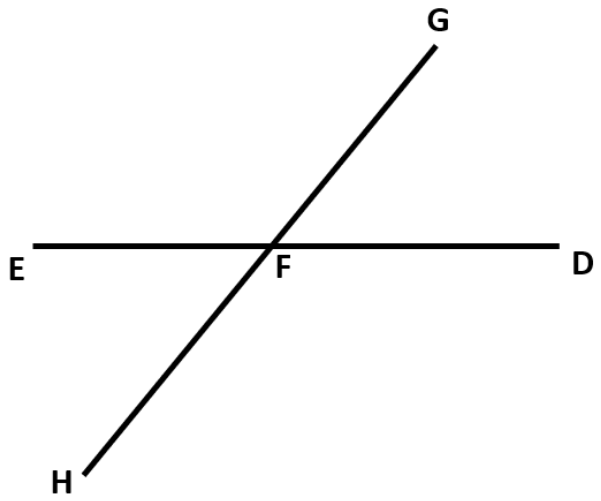
What is the sum of
$C\hat{B}D + D\hat{B}E + E\hat{B}F + A\hat{B}F$?
_____
_____

What can you deduce about the sum of the angles on a straight line?
_____

Investigation 2

Let's investigate vertically opposite angles

1.1)



What size is $D\hat{F}G$? _____

What size is $E\hat{F}G$? _____

What size is $E\hat{F}H$? _____

What size is $H\hat{F}D$? _____

What do you notice about the size of $D\hat{F}G$ and $E\hat{F}H$?

_____

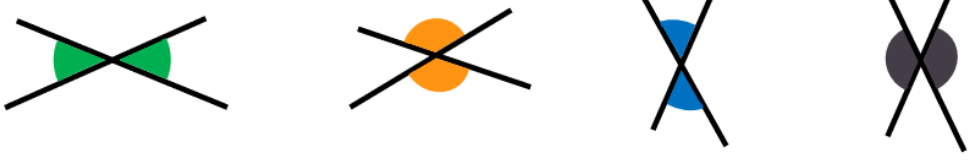
What do you notice about the size of $E\hat{F}G$ and $H\hat{F}D$?

_____

- **$D\hat{F}G$ and $E\hat{F}H$ are called vertically opposite angles**
- **$G\hat{F}E$ and $H\hat{F}D$ are also a pair of vertically opposite angles**

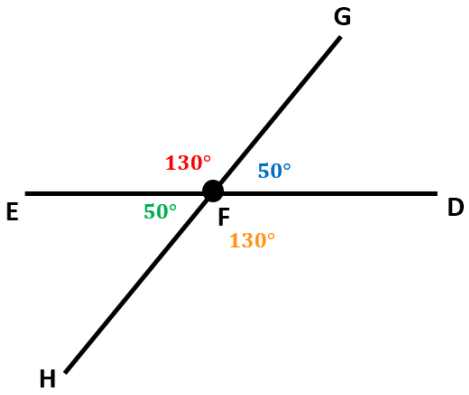
What can we deduce about vertically opposite angles?

_____



Let's investigate angles around a point

2.1)



Determine the sum of

$G\hat{F}D + G\hat{F}E + E\hat{F}G + H\hat{F}D$

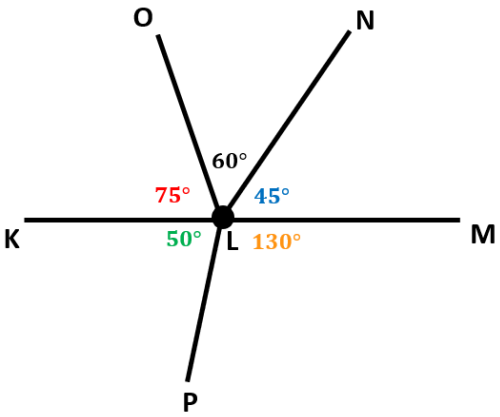
(all the angles around point F)

_____

_____

_____

2.2)



Determine the sum of

$M\hat{L}N + N\hat{L}O + O\hat{L}K + K\hat{L}P + P\hat{L}M.$

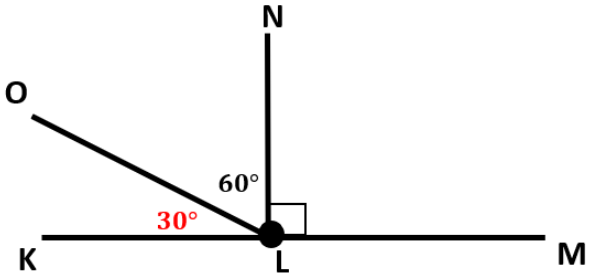
(all the angles around point L)

_____

_____

_____

2.3)



Determine the sum of

$M\hat{L}N + N\hat{L}O + O\hat{L}K + K\hat{L}M.$

(all the angles around point L)

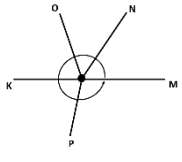
_____

_____

_____

What can we deduce about the sum of the angles around a point?

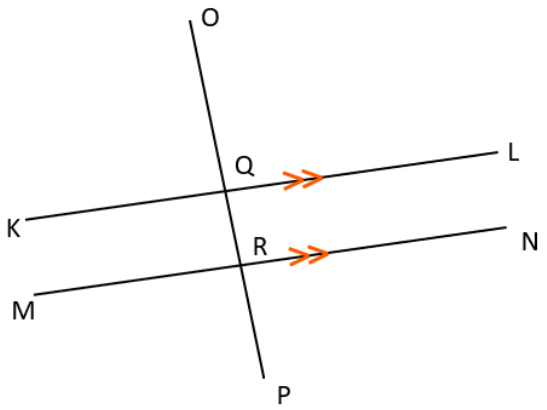
_____



Investigation 3

Let's investigate alternate angles

1.1) Measure the size of the following angles:



1.1.1) $L\hat{Q}R$ _____

1.1.2) $K\hat{Q}R$ _____

1.1.3) $M\hat{R}Q$ _____

1.1.4) $Q\hat{R}N$ _____

1.2) Are there any parallel lines? If yes, name them.

_____

_____

1.2) Are there any pairs of angles that are equal? If yes, name them.

_____

_____

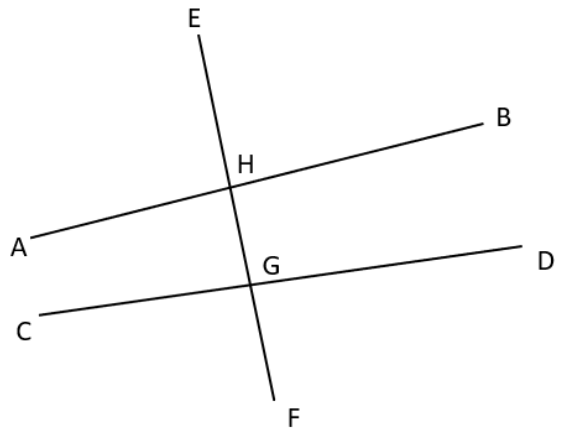
1.3) What can you tell us about the size of the alternate angles formed by parallel lines?

_____

_____

Alternate angles form the letter **Z** on the parallel lines.

2. Measure the size of the following angles:



2.1.1) $B\hat{H}G$ _____

2.1.2) $A\hat{H}G$ _____

2.1.3) $C\hat{G}H$ _____

2.1.4) $D\hat{G}H$ _____

2.2) Are there any parallel lines? If yes, name them.

_____

_____

2.3) Are there any pairs of angles that are equal? If yes, name them.

_____

_____

2.4) What can you tell us about the size of the alternate angles formed by lines that are not parallel?

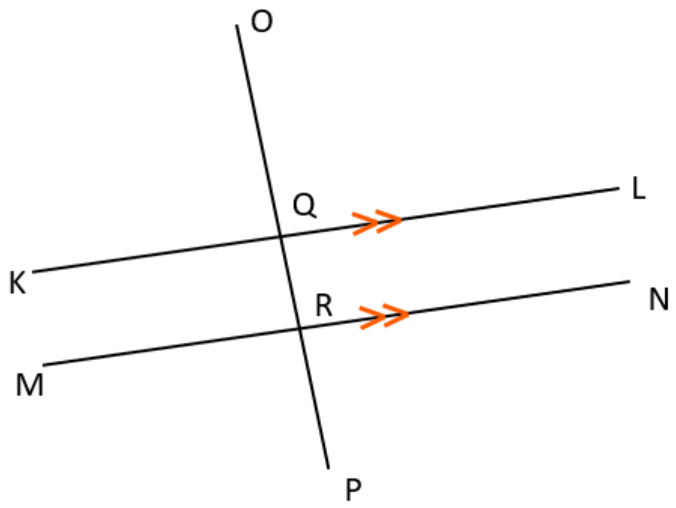
_____

_____

Investigation 4

Let's investigate corresponding angles

1. Measure the size of the following angles:



1.1.1) $L\hat{Q}R$ _____

1.1.2) $K\hat{Q}R$ _____

1.1.3) $M\hat{R}P$ _____

1.1.4) $P\hat{R}N$ _____

1.2) Are there any parallel lines? If yes, name them.

_____

_____

1.3) Are there any pairs of angles that are equal? If yes, name them.

_____

_____

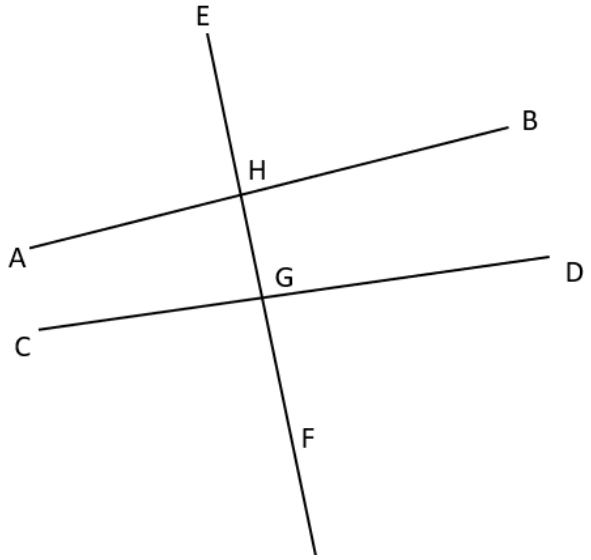
1.4) What can you tell us about the size of the corresponding angles formed by parallel lines?

_____

_____

Corresponding angles form the letter **F** on the parallel lines.

2. Measure the size of the following angles:



2.1.1) $B\hat{H}G$ _____

2.1.2) $A\hat{H}G$ _____

2.1.3) $C\hat{G}F$ _____

2.1.4) $D\hat{G}F$ _____

2.2) Are there any parallel lines? If yes, name them.

_____

_____

2.3) Are there any pairs of angles that are equal? If yes, name them.

_____

_____

2.4) What can you tell us about the size of the corresponding angles formed by lines that are not parallel?

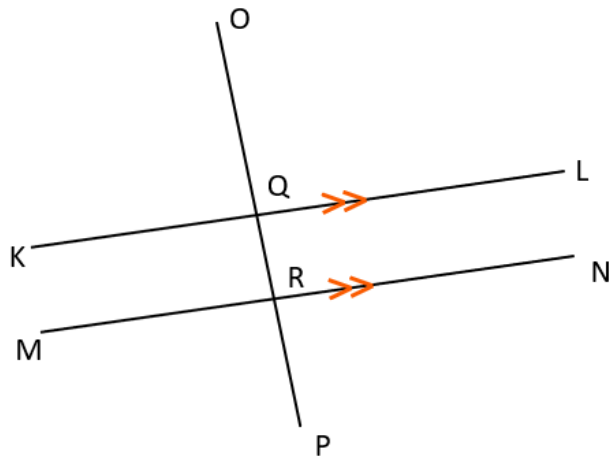
_____

_____

Investigation 5

Let's investigate co-interior angles

1. Measure the size of the following angles:



1.1.1) $L\hat{Q}R$ _____

1.1.2) $K\hat{Q}R$ _____

1.1.3) $M\hat{R}Q$ _____

1.1.4) $N\hat{R}Q$ _____

1.2) Are there any parallel lines? If yes, name them.

_____

_____

1.3) What is the sum of:

1.3.1) $L\hat{Q}R + N\hat{R}Q$ 1.3.2) $K\hat{Q}R + M\hat{R}Q$

_____ _____

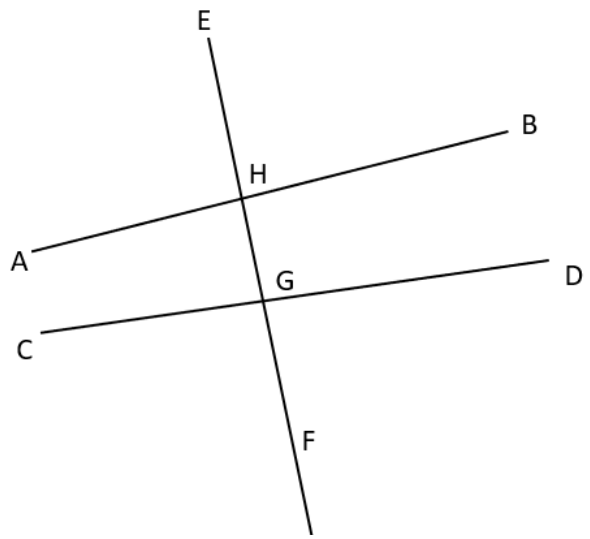
1.4) What can you tell us about the size of the co-interior angles formed by parallel lines?

_____

_____

Co-interior angles form the letter **U** on the parallel lines.

2. Measure the size of the following angles:



2.1.1) $B\widehat{H}G$ _____

2.1.2) $A\widehat{H}G$ _____

2.1.3) $C\widehat{G}H$ _____

2.1.4) $D\widehat{G}H$ _____

2.2) Are there any parallel lines? If yes, name them.

_____

_____

2.3) What is the sum of:

2.3.1) $L\widehat{Q}R + N\widehat{R}Q$

_____

2.3.2) $K\widehat{Q}R + M\widehat{R}Q$

_____

2.4) Do the co-interior angles between lines that are **NOT PARALLEL** add up to $180°$?

_____

_____