

Averages with...

Fractions

Find the mean, median, and range of:

$$3\frac{1}{3}, 6\frac{1}{6}, \text{ and } 2\frac{1}{2}$$

Standard Form

Find the median of the following:

$$3 \times 10^{-4},$$

$$4 \times 10^{-3},$$

$$5 \times 10^{-6},$$

$$6 \times 10^{-5}.$$

Bounds

Find the upper and lower bounds for the median of the following numbers:

3.5 (rounded to one decimal place),

27 (to two significant figures),

30 (to the nearest ten).

Averages with...

Area and Perimeter

A rectangle has a width of 3 cm and a height of 2 cm.

Draw a second rectangle so that the two rectangles have a mean area of 13 cm^2 and have perimeters with a range of 8 cm.

Surds

Zoe says:

*'The mean of $\sqrt{12}$, $\sqrt{27}$,
and $\sqrt{48}$ is $\sqrt{29}$.'*

Explain and correct the mistake that Zoe has made.

Angles

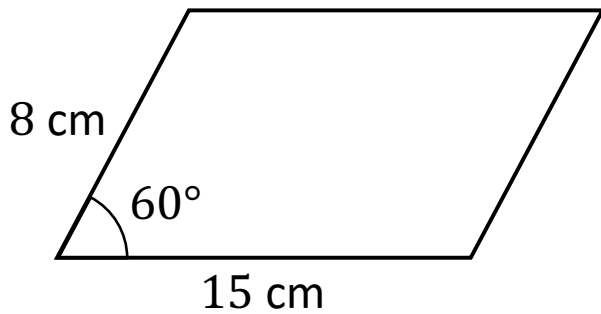
Find the upper bound for the median angle in a quadrilateral.

Is it possible to actually draw a quadrilateral with that median angle?

Trigonometry with...

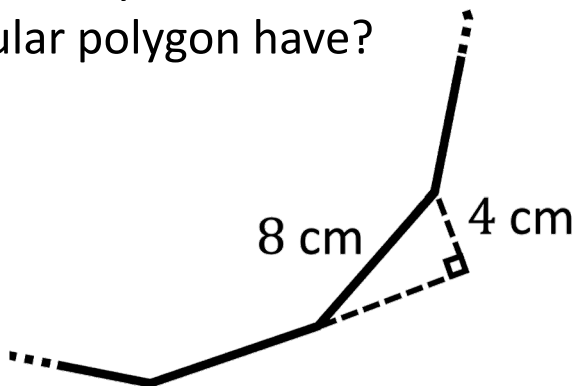
Area

Find the parallelogram's area.



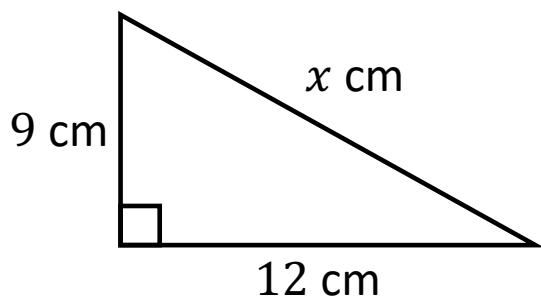
Angles in Polygons

How many sides does the regular polygon have?



Pythagoras

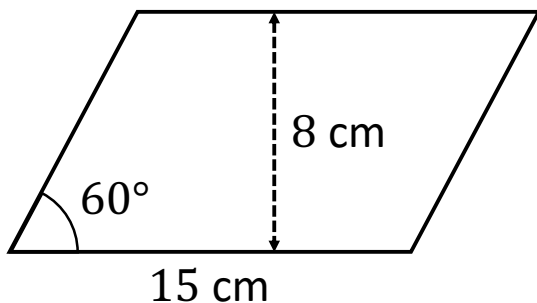
Find x using two different methods.



Trigonometry with...

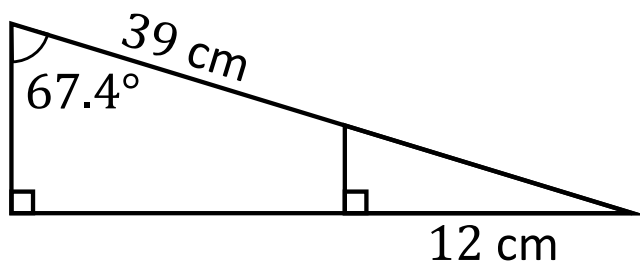
Perimeter

Find the parallelogram's perimeter.



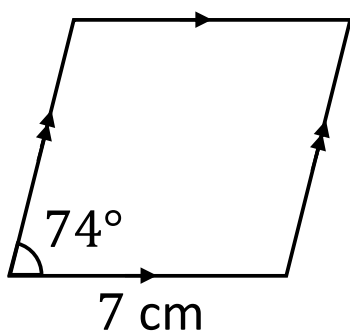
Similar Shapes

Find the area of the big triangle.



Quadrilaterals

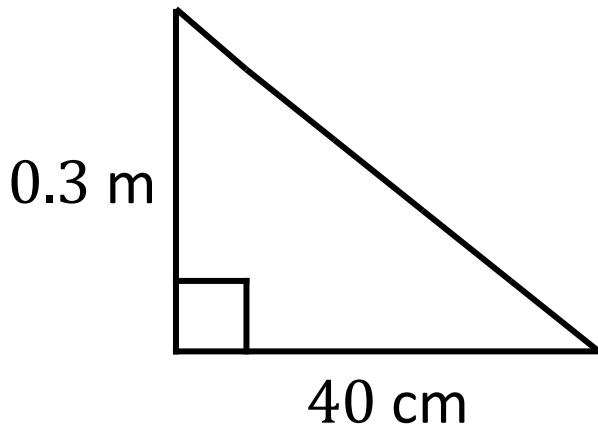
This shape has area 47.1 cm^2 .
Show that it is a rhombus.



Pythagoras with...

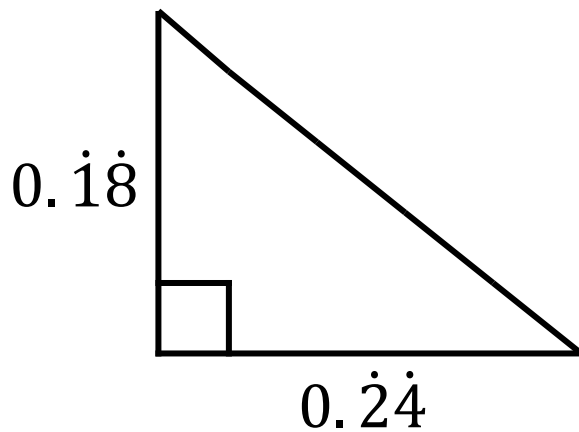
Unit Conversions

Find the hypotenuse.



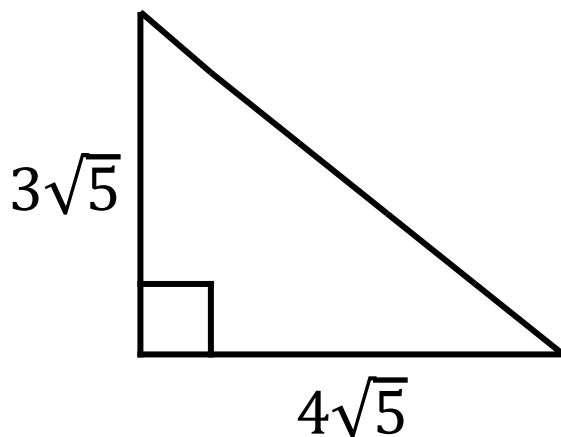
Recurring Decimals

Find the hypotenuse.



Surds

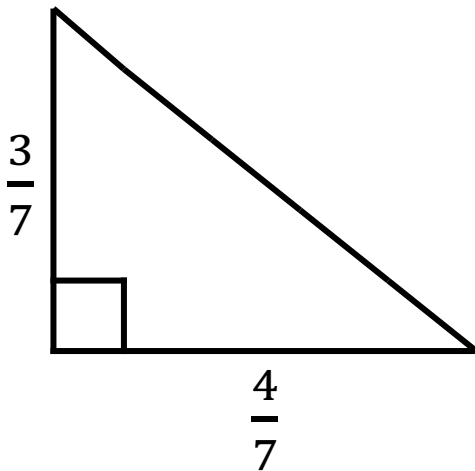
Find the hypotenuse.



Pythagoras with...

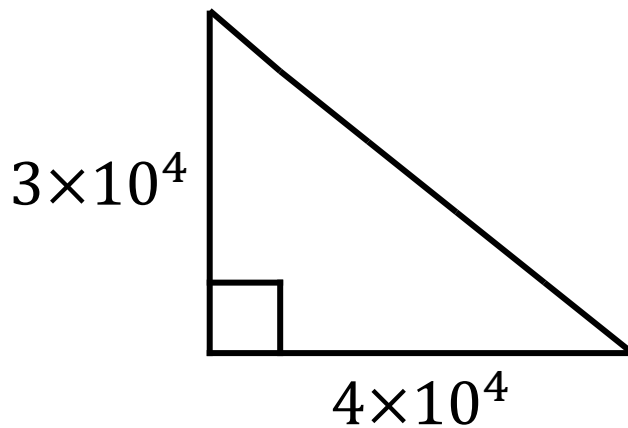
Fractions

Find the hypotenuse.



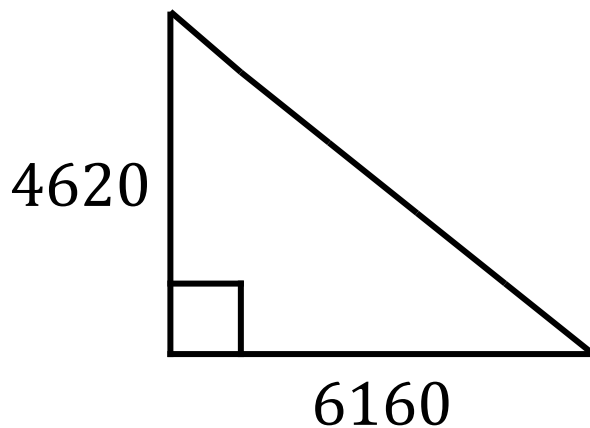
Standard Form

Find the hypotenuse.



Prime Factorisation

Find the hypotenuse.

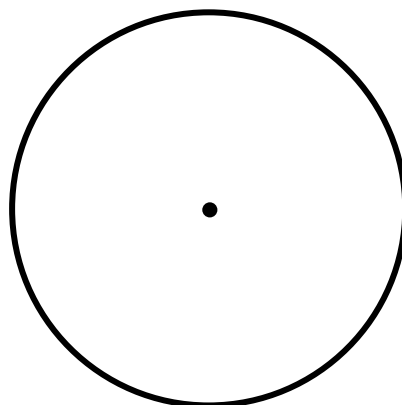


Circle Theorems

C is the centre of the circle, all other points are on the circumference.
All the angles are less than 180° .

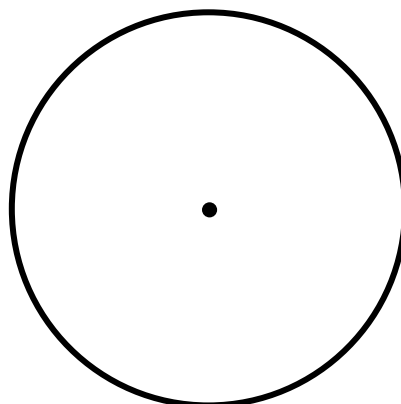
$$\widehat{ADB} = 20^\circ$$

What is \widehat{ACB} ?



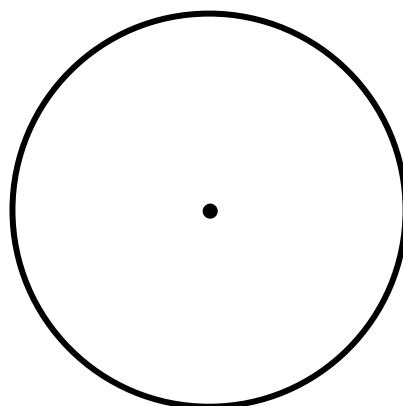
$$\widehat{ACB} = 20^\circ$$

What is \widehat{ABC} ?



$$\widehat{ADB} = 20^\circ$$

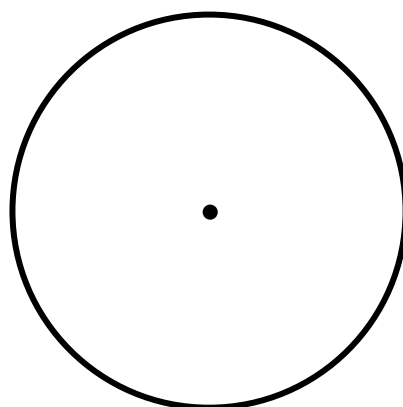
What is \widehat{ABC} ?



$$\widehat{ADB} = 20^\circ$$

What is \widehat{AEB} ?

(2 answers)

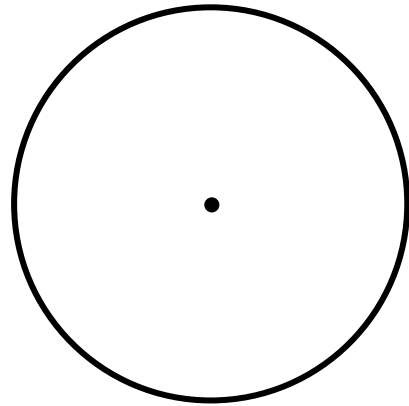


Circle Theorems

C is the centre of the circle, all other points are on the circumference.
All the angles are less than 180° .

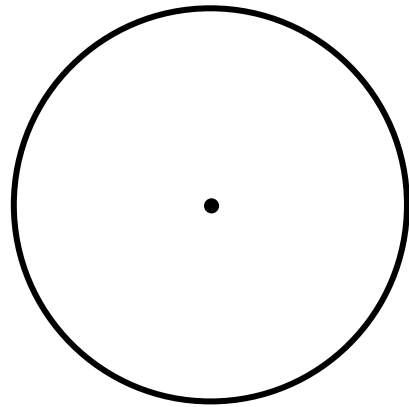
$$\hat{A}BC = 20^\circ$$

What is $\hat{A}CB$?



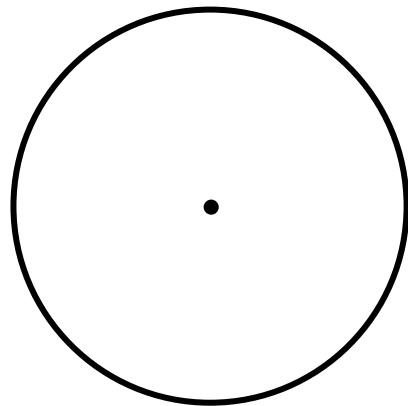
$$\hat{A}BC = 20^\circ$$

What is $\hat{A}DB$?



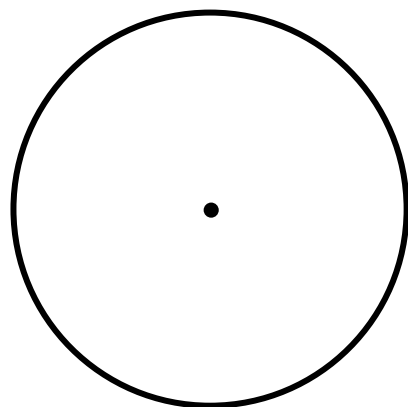
$$\hat{A}DB = 90^\circ$$

What is $\hat{A}EB$?



$$\hat{A}CB = 20^\circ$$

What is $\hat{A}DB$?
(2 answers)



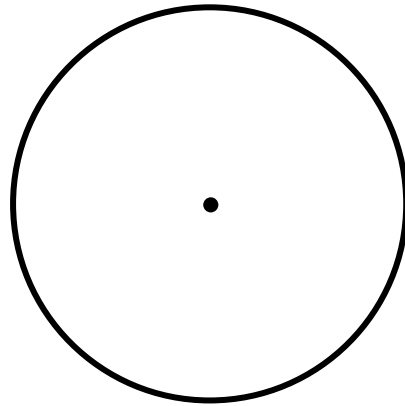
Circle Theorems

C is the centre of the circle, all other points are on the circumference.
All the angles are less than 180° .

Ratio

\widehat{ADB} and \widehat{AEB} are
in the ratio $2 : 7$.

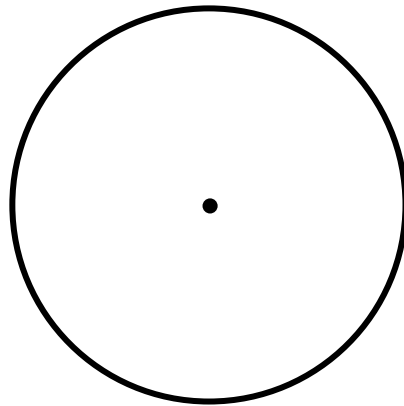
What is \widehat{ADB} ?



Percentages

\widehat{ABC} is 25% of the
size of \widehat{ACB} .

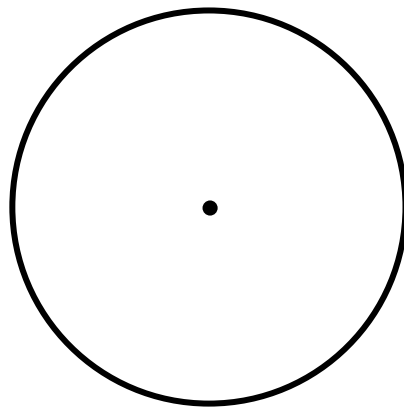
What is \widehat{ABC} ?



Sequences

The angles of
quadrilateral $ABDE$ form
an arithmetic sequence.
The smallest angle is 45° .

What is the second
smallest angle?



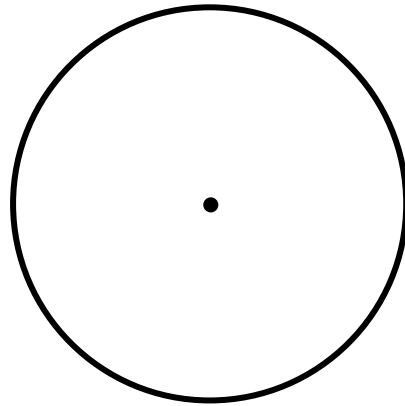
Circle Theorems

C is the centre of the circle, all other points are on the circumference.
All the angles are less than 180° .

Equations

$\hat{A}BC$ is 10° greater
than $\hat{A}DB$.

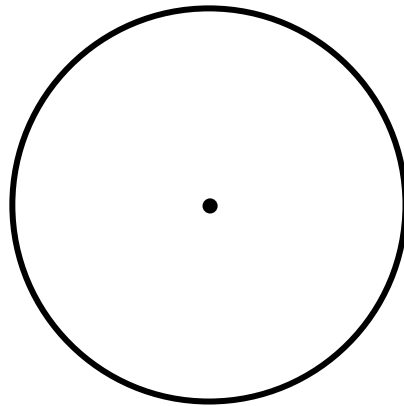
What is $\hat{A}BC$?



Averages

The mean of $\hat{A}CB$
and $\hat{A}DB$ is 24° .

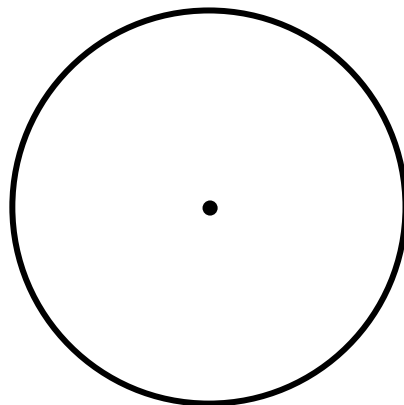
What is $\hat{A}DB$?



Bounds

$\hat{A}CB$ is 30° ,
to the nearest 10° .

What is the range of
possible values for $\hat{A}DB$?



Angles in polygons with...

Ratio

A regular polygon has interior and exterior angles in the ratio

$5 : 1$

How many sides does it have?

Percentages

A regular polygon has exterior angles that are 2.5% of the size of the sum of its interior angles.

How many sides does it have?

Bounds

A regular polygon has interior angles that round to 150° to 2 significant figures.

How many sides could it have?

Angles in polygons with...

Simultaneous Equations

A regular polygon's interior angles are 120° bigger than its exterior angles.

How many sides does it have?

Averages

A polygon has one right angle. The mean of its other angles is 150° .

How many sides does it have?

Sequences

A polygon has angles that form an arithmetic sequence. Its smallest angle is 135° and its largest angle is 177° .

How many sides does it have?

Rounding with...

Fractions

Which of the following round to 0.3 to one decimal place:

$\frac{1}{3}$	$\frac{35}{99}$	$\frac{25}{99}$
$\frac{1}{4}$	$\frac{35}{100}$	$\frac{25}{100}$
$\frac{1}{5}$	$\frac{35}{101}$	$\frac{25}{101}$

Standard Form

Which of the following round to 0.001 to one significant figure:

9.4×10^{-4}
9.5×10^{-3}
1.4×10^{-3}
1.4×10^{-2}

Substitution

Which of the following round to 40 to the nearest 10 when:

$$a = 30, b = 4, c = -0.5$$

$a + b + 2c$	$a + b - 2c$
$a + 4b + 2c$	$a + 4b - 2c$

Rounding with...

Decimals

Which of the following round to 0.2 to one decimal place:

$$0.195 + 0.045$$

$$0.195 - 0.045$$

$$0.2 \times 1.25$$

$$0.2 \div 1.25$$

Surds

Which of the following round to 10 to one significant figure:

$$\sqrt{26}$$

$$\sqrt{200}$$

$$\sqrt[3]{2000}$$

$$2\sqrt{21}$$

$$4\sqrt{14}$$

$$\sqrt[3]{3000}$$

$$3\sqrt{11}$$

$$3\sqrt{26}$$

$$\sqrt[3]{4000}$$

Equations

Which of the following have solutions that round to 8 to the nearest even number.

$$5x = 35$$

$$4x = 35$$

$$5x + 1 = 35$$

$$5x - 1 = 35$$

Linear equations from...

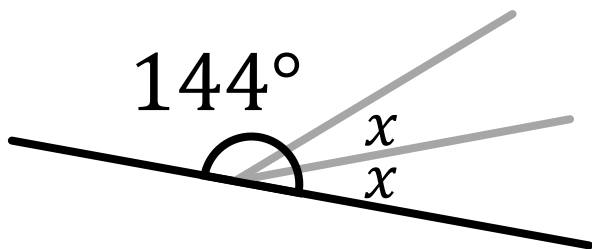
Straight Line Graphs

The point $(x, 180)$ lies on the line $y = 2x + 144$.

Find the value of x ?

Angles

Form and solve an equation to find the value of x .



Functions

$$f(x) = 180 - ax$$

When 2 is inputted into the function, the output is 144.

Find the value of a .

Linear equations from...

Perimeter

Form and solve an equation to find the value of x .

$$72 \quad \boxed{P = 180}$$
$$x$$

Probability

A bag contains x red counters and x blue counters. The rest of the 180 counters are green.

The probability of choosing a green counter at random is 80%. Find x .

Ratio

Anne and Bob share £180 in the ratio $72 : x$

Anne receives £144.

Form and solve an equation to find the value of x .