Differentiation in KS3 Angles on a line and around a point

Attainment Level 1

Objective

Angles on a straight line

How many degrees are there on a straight line?

Find the size of the angle marked *t*. (Hint: there are 180° on a straight line.) — t, $50°$

Work of the size of the angle marked *z*. — $120°$, z

Work out the size of the angle *r*. — r, $65°$

Work of the size of the angle marked *n*. — n, $28°$

What is the size of angle *p*? — $60°$, $80°$, p

Find the size of angle *n*. — n, $50°$, $75°$

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Objective

Angles around a point

What is the size of angle *x*? — $120°$, x — Angles around a point sum to 360°

What is the size of angle *t*? — t, $310°$

Work of the size of the angle labelled *h*. — $115°$, h

What is the value of *a*? — a, $183°$

Find the value of *r*. — r, $274°$

What must angles *a*, *b* and *c* add up to? — c, a, b

What is the size of angle *g*? — g, $100°$, $150°$

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Objective

Angle facts

Work out the size of angle *u*. — u, $30°$

Work out the size of the angle marked *z*. — $140°$, z

Work out the size of the angle labelled *h*. — $125°$, h

Work out the size of the angle marked *n*. — n, $36°$

What is the value of *a*? — a, $186°$

Work out the size of the angle *p*. — $40°$, $85°$, p

What is the size of angle *d*? — d, $120°$, $37°$

Work out the size of the angle marked *y*. — y, $40°$

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The first two objectives have been designed to

- provide a scaffolded introduction to angle calculations
- gradually increase the complexity of the calculations, ensuring that when any new ideas are introduced, the concept is the focal point rather than the arithmetic

The third objective has been designed to

- interleave different angle facts, facilitating learning by encouraging recall
- start by consolidating learning points students have seen previously, with different numbers, and build to more challenging practice

Throughout, the questions have been designed and selected to

- ensure that students need to find a mixture of acute, obtuse and reflex angles
- expose students to a range of different letters representing unknown angles

Attainment Level 4

Objective

Angles on a line and around a point

Calculate the size of angle *n*. — $65°$, $65°$, n

The semicircle below is split into 3 equal pieces. Work out the size of angle *x*. — x

Both of the angles marked *q* are the same size. What is the value of *q*? — $110°$, q, q, weight

The two angles below are on a straight line.

a) Write an equation that describes the angles below

b) Solve the equation to find the value of *x*. — $135°$, x

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Given that $y = 4x$, what is the value of *x*? — y, x

Look at the curved piece of track in the diagram. How many of these curved pieces are needed to make a **complete circle** of track? — $40°$

Between 2 pm and 6 pm, the hour hand on the clock moves from the 2 to the 6. What angle does it turn through?

Olga has been given two mixed-up puzzles; one is a semicircle and the other is a circle. One of the sectors is missing. What is the size of the central angle of the missing sector? — $34°$, $128°$, $80°$, $56°$

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This objective has been designed for students who are already confident working with angles on a line and about a point. The task interleaves the two concepts, as well as providing students with plenty of opportunities to apply their knowledge to unfamiliar problems.

There are also objectives available at Attainment Levels 2 and 3.

There is deliberate overlap in the concepts covered and questions asked at consecutive levels, ensuring no student's learning is capped. This also helps students to confidently and smoothly progress through the levels where appropriate.

Sparx Maths