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Lines and Angles

Solutions & Answer Key

Full worked solutions, marking scheme & answer key

IGCSE Mathematics

The Panda Math Tutor

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Companion to the *Student Worksheet*

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Note

About this booklet. These are the complete solutions to every question in the *Lines and Angles — Student Worksheet*. Question numbers match exactly (TA1–TA6, SL1–SL7, AP1–AP7, VO1–VO6, PL1–PL8, MS1–MS6, the Mixed Review MR1–MR10, and the examination questions Q1–Q8).
Each solution names the angle fact used at every step, exactly as you must do in the examination. Where a question needs two or more steps, the steps are numbered so you can see the chain of reasoning. Part V collects the common mistakes to watch for, and Part VI is a quick answer key for fast marking.

4 Part IV — Complete Solutions

Note

Each solution follows the same reasoning pattern used in the notes: identify the angle relationship, name it, form the equation, solve, then check. **The reason is part of the answer** — an answer with no reason loses marks even when the number is correct.

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4.1 Solutions — Types of Angles

Solution TA1

(a) 47° — **acute** (between 0° and 90°).
(b) 163° — **obtuse** (between 90° and 180°).
(c) 90° — **right angle**.
(d) 205° — **reflex** (between 180° and 360°).
(e) 180° — **straight angle**.
(f) 88° — **acute** (just under 90°, so not a right angle).

Solution TA2

(a) Complementary angles add to 90°: $90° - 28° = 62°$.
(b) Supplementary angles add to 180°: $180° - 28° = 152°$.

Solution TA3

Let the smaller angle be x; the other is $3x$. They are complementary, so

$$x + 3x = 90^\circ \implies 4x = 90^\circ \implies x = 22.5^\circ.$$

The angles are 22.5° **and** 67.5°**.**
Check: $22.5 + 67.5 = 90$ ✓, and $3 \times 22.5 = 67.5$ ✓.

Solution TA4

Let the angle be x. Its supplement is $180^\circ - x$, and the angle is 40° larger:

$$x = (180 - x) + 40 \implies x = 220 - x \implies 2x = 220 \implies x = 110^\circ.$$

The supplement is $180^\circ - 110^\circ = 70^\circ$.
Answer: 110° **and** 70°**.** **Check:** $110 + 70 = 180$ ✓and $110 - 70 = 40$ ✓.

Solution TA5

The acute angle and the reflex angle together make a complete turn about the point, and *angles at a point add up to* 360°:

$$360^\circ - 74^\circ = 286^\circ.$$

Answer: 286° (which is indeed between 180° and 360°, so it is reflex ✓).

Solution TA6

Write the angles as $4k$ and $5k$. Complementary angles add to 90°:

$$4k + 5k = 90^\circ \implies 9k = 90^\circ \implies k = 10^\circ.$$

So the angles are $4 \times 10 = 40^\circ$ and $5 \times 10 = 50^\circ$.
Both are less than 90°, so **both angles are acute**.
Check: $40 + 50 = 90$ ✓and $40 : 50 = 4 : 5$ ✓.

Common Mistake

Complementary (90°) and supplementary (180°) are easy to swap. C comes before S in the alphabet, and 90 comes before 180 — use that to keep them straight.

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Preview ends here

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