



Geometry

TESTS ALGEBRA I MASTERY AND SPATIAL READINESS • 20 ITEMS • 60-75 MINUTES • CALCULATOR ON SECTION B ONLY

PMC Geometry opens with logic, so this diagnostic checks two things at once: whether the algebra the course leans on is secure, and whether a student can already reason from given statements rather than from appearance. Items about diagrams deliberately test what may NOT be assumed.

BEFORE YOU BEGIN

No calculator unless a question says otherwise. Show your working - the method tells us more than the answer.

Leave a question blank rather than guessing. A blank tells us it is unfamiliar; a wrong answer tells us what is believed.

Work alone. Nobody should explain the mathematics or suggest a method.

Stop and resume later if you tire. This is a picture of understanding, not a race.

SECTION A Multiple choice

10 items

Choose one answer. If you are unsure, leave it blank rather than guessing.

01 Solve for x : $3x - 7 = 2x + 5$

- A) 12
- B) -2
- C) 2
- D) -12

02 Two angles are supplementary. One is 65 degrees. The other is

- A) 115
- B) 25
- C) 35
- D) 295

03 If a triangle has sides 3, 4 and 5, it is

- A) Right-angled
- B) Equilateral
- C) Obtuse
- D) Impossible



- 04 The contrapositive of 'If it is a square, then it has four sides' is
- A) If it does not have four sides, then it is not a square
 - B) If it has four sides, then it is a square
 - C) If it is not a square, then it does not have four sides
 - D) A square has four sides
- 05 In a diagram, two segments LOOK equal but are not marked equal. You may
- A) Not assume they are equal
 - B) Assume they are equal
 - C) Measure with a ruler
 - D) Assume the diagram is wrong
- 06 The area of a circle with radius 5 is
- A) 25π
 - B) 10π
 - C) 5π
 - D) 50π
- 07 Which transformation preserves both size and shape but reverses orientation?
- A) Reflection
 - B) Dilation
 - C) Rotation
 - D) Translation
- 08 The sum of the interior angles of a pentagon is
- A) 540
 - B) 360
 - C) 720
 - D) 450
- 09 Two triangles have all three pairs of angles equal. They must be
- A) Similar
 - B) Congruent
 - C) Both
 - D) Neither



10 The distance between (1,2) and (4,6) is

- A) 5
- B) 7
- C) 25
- D) 3

SECTION B Student solving

6 items

Show your working. We are reading the method, not only the answer.

11 Find x , and state the reason for each step: angles $(2x + 10)$ and $(3x - 5)$ are vertical angles.

12 A ladder 13 m long leans against a wall with its foot 5 m from the base. How high does it reach? Draw a diagram first.



- 13 Write the converse of: 'If two angles are vertical, then they are congruent.' Is the converse true? Explain.

- 14 A rectangle has area 48 sq cm and length 12 cm. Find its perimeter. Show your reasoning.

- 15 Triangle ABC has vertices A(0,0), B(4,0), C(4,3). Find its area and its perimeter.



- 16 Explain the difference between similar and congruent figures. Give an example of each.

SECTION C Error analysis

4 items

Each shows work containing a mistake. Find the FIRST incorrect step, say what the student believed, and give the correct answer.

- 17 Find the first incorrect step and correct it.

Circle radius 6.
Area = $2 \times \pi \times 6$
Area = 12π

- 18 Explain the flaw in this proof step.

Given: triangles ABC and DEF
with angle A = angle D.
Student: therefore the triangles
are congruent.

- 19 Find the error in this reasoning about the diagram.

The diagram shows a quadrilateral
whose sides look parallel.
Student: it is a parallelogram,
so opposite angles are equal.

- 20 Find the first incorrect step and give the correct answer.

Right triangle, legs 6 and 8.
Hypotenuse: $6 + 8 = 14$

What happens next

Bring this completed sheet to your consultation. A tutor reads it alongside a short conversation with the student and any school work you choose to share, then recommends a level. No placement is ever decided by a score on its own, and no student is placed without a tutor's approval.