# Engineering Graphics and Design Know the method.

## GRADE 12 • 2026 • DBE/CAPS

## Free starter pack

3 worked methods • 3 practice questions • explained answers

Read the projection system and scale first. Lay out views lightly, project corresponding points, retain required construction and darken only the final lines. Sketches in this pack explain methods; draw instrument answers on separate paper.

## Use this pack actively

1. Choose a method from the clickable index. Try the worked question before reading its steps.

2. Complete Your turn, then follow its answer link. Correct your first error and retry without copying.

3. Mix methods and use complete official papers to practise unfamiliar contexts and time management.

Paper 1 is BLUE; Paper 2 is PURPLE. Written labels remain useful in grayscale.

Original practice, not reproduced or predicted DBE exam questions. The fuller pack supports the R99 offer. Editorial draft: independent subject-teacher moderation is still required. Selected core methods do not replace the full syllabus, practical preparation or PAT.

# Question-method index

Click a method to open it. Each practice question links to its explained answer.

## Paper 1

MR-EGD-01 | Convert a real length to a drawing • p. 4

MR-EGD-03 | Find internal room dimensions • p. 5

## Paper 2

MR-EGD-07 | Project a mechanical block • p. 6

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# Your examination map

## Paper 1 • 180 min • 200 marks

Civil: first-angle orthographic projection, civil working drawings, solid geometry and developments, two-point perspective.

## Paper 2 • 180 min • 200 marks

Mechanical: third-angle orthographic projection, mechanical assembly, cams and mechanisms, isometric drawing.

## Plan time from the actual instructions

Paper 1: reserving 15 minutes leaves about 0.82 minutes per mark. Use this only as a planning guide.

Paper 2: reserving 15 minutes leaves about 0.82 minutes per mark. Use this only as a planning guide.

PAT is a separate assessment component. Use the current official PAT instructions and your teacher deadlines. This pack does not supply a completed PAT for submission.

## What still needs practice

Extend to full architectural sections with conventions, complex interpenetration, inclined solids, sectional assemblies, complete cam profiles and timed instrument drawing. PAT remains separate.

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# Convert a real length to a drawing

MR-EGD-01 • Keep drawing and real units the same.

## Worked question

A wall is 4800 mm long. Draw its length at 1 : 100 and state the dimension label.




Original method sketch; schematic unless stated. Use the given values, not measurements from this image.

1. At 1 : 100, divide the real length by 100.

2. Drawing length: $\frac{4800}{100} = 48$ mm.

3. Draw a 48 mm line using instruments.

4. Write the actual dimension 4800, not 48, on its dimension line.

## Check the reasoning

The drawing is reduced; the dimension states the real size.

## Avoid this mistake

Do not change the dimension label to the scaled measurement.

## Your turn

Represent a 3600 mm wall at 1 : 50. State length and label.

Click here for the explained practice answer.

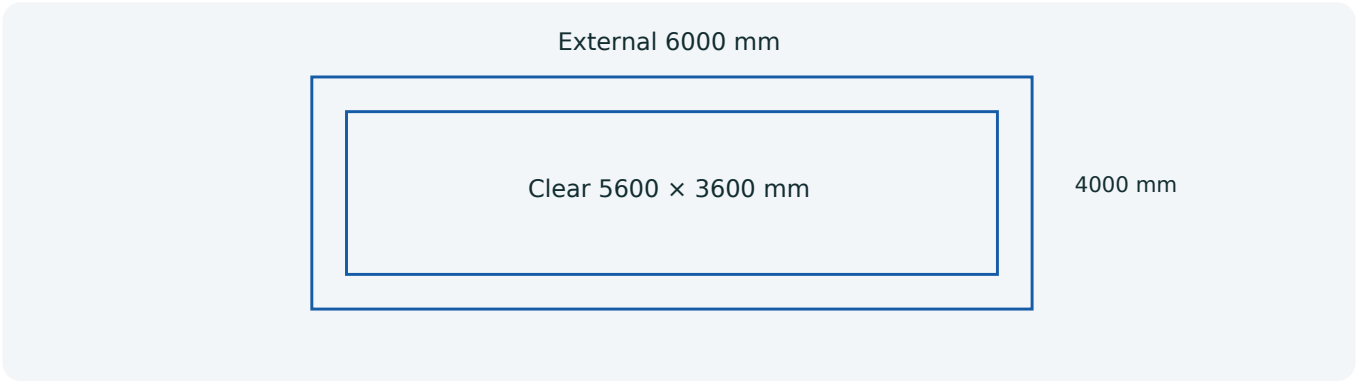
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# Find internal room dimensions

MR-EGD-03 • Subtract both enclosing wall thicknesses.

## Worked question

A rectangular building is 6000 mm by 4000 mm externally. All enclosing walls are 200 mm thick; there are no internal walls. Calculate internal dimensions and usable floor area.




Original method sketch; schematic unless stated. Use the given values, not measurements from this image.

1. Internal length: $6000 - 200 - 200 = 5600$ mm.
2. Internal width: $4000 - 200 - 200 = 3600$ mm.
3. Convert to metres: 5.6 m by 3.6 m.
4. Area: $5.6 \times 3.6 = 20.16 m^2$.
5. Draw parallel inner and outer wall faces at the specified scale.

## Check the reasoning

Both ends of each dimension contain wall thickness.

## Avoid this mistake

Subtracting only one wall gives an incorrect clear dimension.

## Your turn

External dimensions 5000 by 4000 mm, walls 250 mm. Find internal area.

Click here for the explained practice answer.

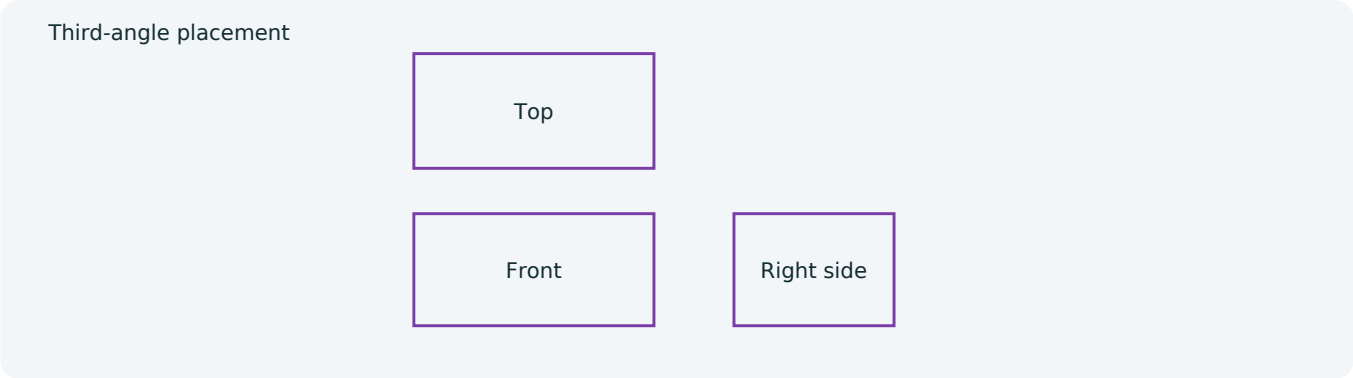
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# Project a mechanical block

MR-EGD-07 • Third-angle places each view on the viewing side.

## Worked question

Draw the same 60 by 40 by 30 mm block using third-angle front, top and right-side views.




Original method sketch; schematic unless stated. Use the given values, not measurements from this image.

1. Front view: 60 mm wide and 30 mm high.
2. Top view goes above the front, 60 mm by 40 mm.
3. Right-side view goes to the right, 40 mm by 30 mm.
4. Use projection lines to keep common dimensions aligned.
5. Add the required projection symbol when instructed.

## Check the reasoning

Third-angle top-above contrasts with first-angle top-below.

## Avoid this mistake

The object dimensions do not change when the projection system changes.

## Your turn

Repeat for width 50 mm, depth 20 mm and height 25 mm.

Click here for the explained practice answer.

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# Convert a real length to a drawing

MR-EGD-01 • Practice answer

Represent a 3600 mm wall at 1 : 50. State length and label.

## Step-by-step answer

1. Drawing length $\frac{3600}{50}$ = 72 mm.

2. Label the actual dimension 3600.

## Make the correction useful

Explain your first missed step, correct it and repeat the task without copying. For practical tasks, inspect the saved result rather than only reading the solution.

Return to the worked method

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# Find internal room dimensions

MR-EGD-03 • Practice answer

External dimensions 5000 by 4000 mm, walls 250 mm. Find internal area.

## Step-by-step answer

1. Internal 4500 by 3500 mm = 4.5 by 3.5 m.

2. Area $15.75 m^2$.

## Make the correction useful

Explain your first missed step, correct it and repeat the task without copying. For practical tasks, inspect the saved result rather than only reading the solution.

Return to the worked method

# Project a mechanical block

MR-EGD-07 • Practice answer

Repeat for width 50 mm, depth 20 mm and height 25 mm.

## Step-by-step answer

1. Front 50 by 25 mm.

2. Top above 50 by 20 mm.

3. Right view on right 20 by 25 mm.

## Make the correction useful

Explain your first missed step, correct it and repeat the task without copying. For practical tasks, inspect the saved result rather than only reading the solution.

Return to the worked method

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# Continue with official papers

Scope checked 9 October 2026. The source links support the assessment map; all worked and practice questions in this pack are newly authored.

Subject examination guideline

2026 ATP retention and CAT / IT update exceptions

2021 guideline extension through 2026

DBE annual teaching plans

DBE released 2026 papers and marking guidelines

Current official PAT directory

## Error log

Question ID: _____ Date: _____
First incorrect step: _____
Why it failed: _____
Correct method: _____
Retry date and result: _____

Use the matching memo, answer book and addenda for the actual paper. Questions here have no official mark allocation. Check explanations with your teacher before using these drafts as a sole revision source.

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