10.3 Ordnance Survey Map Skills: Relief, Contours and Cross Sections: 30-minute Pack

AQA 8035 · Calculators not allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Give TWO limitations of using only contour lines on a map to interpret ground conditions and relief.

(Total for Question 1 is 2 marks)

2 Define the term 'vertical exaggeration' as it applies to a cross-section drawn from a contour map.

(Total for Question 2 is 1 mark)

3 A survey recorded the elevation, in metres, of eight points at regular intervals along a footpath climbing a gentle, even slope: 50, 60, 70, 80, 90, 100, 110 and 120. Calculate the interquartile range (IQR) of these elevations.

(Total for Question 3 is 4 marks)

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4 Evaluate how useful contour information from an Ordnance Survey map is for deciding where to build new houses in an upland area, compared with visiting the site in person.

(Total for Question 4 is 6 marks)

5 Identify the landform at grid reference 26 61 on Figure 1, where contours form a V shape pointing towards that grid square and lowest contour there is 80 m.

(Total for Question 5 is 2 marks)

6 State one reason for using vertical exaggeration when drawing a cross-section and one problem that it can cause.

(Total for Question 6 is 2 marks)

7 Figure 2 extract description: a broad upland area in the north of the extract is mostly flat at about 180 m, with very few contours across its top. Closely spaced lower contours (160 m, 140 m, 120 m) mark a steep edge around it. Identify the OS contour landform shown by this pattern and give one reason from the description.

(Total for Question 7 is 2 marks)

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8 Figure 2 extract description: at grid reference 30 65 the contours (200 m, 180 m) form a narrow tongue of higher ground extending out from the main upland into lower surrounding ground on three sides, without closing into a full loop. Identify the precise OS contour landform term shown at 30 65 and give one reason from the description.

(Total for Question 8 is 2 marks)

9 Figure 1 extract description: In the south-east quadrant contours form a clear V shape pointing north-east towards grid 26 61, with contours 120 m, 100 m, 80 m in the V and closely spaced contours on the valley sides. Describe the relief and shape of the land in this south-east area and explain what the V-shaped contours indicate.

(Total for Question 9 is 3 marks)

10 Figure 2 extract description: on the eastern edge of the extract, contours at 200 m, 180 m, 160 m and 140 m run very close together in a continuous line, forming a steep scarp slope. Beyond 140 m the contours open out sharply into a gentler dip slope. Identify the OS contour landform represented by this scarp-and-dip-slope pattern and give one reason.

(Total for Question 10 is 2 marks)

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Mark scheme · 10.3 Ordnance Survey Map Skills: Relief, Contours and Cross Sections: 30-minute Pack

Question 1

contours do not show surface cover or vegetation which can affect actual slope stability and usability, oe — **B1**

map contours are a simplification at set intervals so small local features or cliffs between contours may not be shown, oe — **B1**

Answer: Contours do not show surface cover or vegetation, which affect slope stability and use. Also contours are at set intervals so small features or cliffs between contours may be omitted.

Question 2

when the vertical scale of a cross-section is drawn larger than the horizontal scale, which exaggerates the appearance of the relief, oe — **B1**

Answer: Vertical exaggeration is when the vertical scale of a cross-section is drawn larger than the horizontal scale, which exaggerates the appearance of the relief.

Question 3

data split into a lower half (50, 60, 70, 80) and an upper half (90, 100, 110, 120), oe — **M1**

lower quartile = (60 + 70) / 2 = 65 m cao — **A1**

upper quartile = (100 + 110) / 2 = 105 m cao — **A1**

IQR = 105 - 65 = 40 m cao — **A1**

Answer: Interquartile range = 40 m (lower quartile 65 m, upper quartile 105 m).

Question 4

Level 3 A detailed, balanced evaluation that weighs the strengths of contour information (overview, cost, speed) against its limitations (missed detail, out-of-date survey, no ground-condition data) compared with a site visit, and reaches a clear, supported judgement. — **5-6**

Level 2 A reasonable evaluation identifying some strengths and some limitations of using contour information rather than visiting the site, with limited supporting detail or a partly developed judgement. — **3-4**

Level 1 One or two simple points about maps or site visits are made, with little comparison or development, and any judgement is unsupported. — **1-2**

Indicative content:

- Contours show the overall shape, height and steepness of the land without needing to visit the site, which is quicker and cheaper, especially for a large or hard-to-reach area.
- Contour maps allow gently sloping, lower-risk building sites to be identified remotely, and can be used alongside other map information such as roads and rivers to plan access.
- Contours only show height at fixed intervals, so small-scale features between contour lines, such as a rock outcrop or a small stream channel, may not be shown.
- A map may be out of date: erosion, small landslips or drainage changes since the survey was made would not appear on it.
- Contours do not show ground conditions that matter for building, such as soil type, vegetation or ground stability, which only a site visit can reveal directly.
- A site visit is more time-consuming and costly, especially over a large area, and weather or access problems can make some areas difficult to survey in person.
- A balanced conclusion might judge that contour maps are very useful for an initial, low-cost overview and for ruling out clearly unsuitable steep areas, but that a site visit remains essential before any building decision is finalised.

Question 5

a valley or a stream channel — **B1**

reason, eg V-shaped contours pointing to the grid reference and lower elevation inside the V, oe — **B1**

Answer: A valley or stream channel, indicated by V-shaped contours pointing to the grid reference and lower elevation inside the V.

Question 6

reason: it makes small changes in relief or slope easier to see when the horizontal distance covered is much greater than the vertical change in height, oe — **B1**

problem: it can make slopes look steeper than they really are, giving a misleading impression of the true relief, oe — **B1**

Answer: Reason: it makes small changes in relief easier to see when the horizontal distance is much greater than the vertical change. Problem: it can make slopes look steeper than they really are, giving a misleading impression of the true relief.

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Question 7

a plateau, ie a flat-topped upland area **B1**

reason, eg a broad upland area at a high, roughly constant elevation with very few contours across its flat top, but steep, closely spaced contours around its edge, oe **B1**

Answer: A plateau, shown by a broad upland area at a roughly constant high elevation with very few contours across the flat top, and steep, closely spaced contours marking its edge.

Question 8

a spur **B1**

reason, eg the contours form a tongue-shaped projection of higher ground running out into lower land on three sides rather than forming a closed loop, oe **B1**

Answer: A spur, shown by contours forming a tongue-shaped projection of higher ground extending into lower land on three sides rather than closing into a loop.

Question 9

relief is lower in the south-east with contours down to about 80 m, oe **B1**

V-shaped contours pointing towards 26 61 indicate a valley or stream channel, oe **B1**

closely spaced contours on the valley sides show relatively steep slopes there, oe **B1**

Answer: The south-east is lower ground down to about 80 m; the V-shaped contours pointing towards 26 61 show a valley or stream channel. The closely spaced contours on the valley sides show relatively steep slopes at that location.

Question 10

an escarpment **B1**

reason, eg the closely packed contours show a steep scarp slope, while the sudden widening shows a much gentler dip slope beyond it, a shape typical of an escarpment, oe **B1**

Answer: An escarpment, shown by closely packed contours indicating a steep scarp slope, followed by a sudden widening indicating a much gentler dip slope, which is the shape typical of an escarpment.

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