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# **GCSE MARKING SCHEME**

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**SUMMER 2017**

**GCSE (NEW)  
MATHEMATICS - UNIT 2 (HIGHER)  
3300U60-1**

## **INTRODUCTION**

This marking scheme was used by WJEC for the 2017 examination. It was finalised after detailed discussion at examiners' conferences by all the examiners involved in the assessment. The conference was held shortly after the paper was taken so that reference could be made to the full range of candidates' responses, with photocopied scripts forming the basis of discussion. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners.

It is hoped that this information will be of assistance to centres but it is recognised at the same time that, without the benefit of participation in the examiners' conference, teachers may have different views on certain matters of detail or interpretation.

WJEC regrets that it cannot enter into any discussion or correspondence about this marking scheme.



GCSE MATHEMATICS Unit 2 : Higher tier Summer 2017	✓	Mark	MARK SCHEME Comments
7.(a) 0.3(0) on 'box C branch'.		B1	
7.(b)  Sight of 0.45 × 0.7 OR 0.25 × 0.4 OR 0.3 × 0.8  0.45 × 0.7 + 0.25 × 0.4 + 0.3 × 0.8 ( 0.315 + 0.1 + 0.24 ) = 0.655 or 131/200 or equivalent ISW		B1  M1  A1	FT 'their 0.3' from box C branch, only if, between 0 and 1.  Provided less than 1.
7.(c) $\frac{1}{3}$		B1	F.T. for the fraction that is the nearest to 1- 'their 0.655' provided 0 < 'their 0.655' < 1 Correct answer of 1/3 gains B1 regardless.
8.(a) $x(x^2 - 5)$		B1	
8.(b) $2x^2 + 5x - 12$		B2	B1 for $2x^2 + kx - 12$ OR $2x^2 + 5x + k$
8.(c) $(x - 7)(x + 4)$ ISW		B2	B1 for $(x \dots 7)(x \dots 4)$ .
9.(a) $3y = 2x + 7$		B1	
9.(b) $y = \frac{-x + 3}{5}$		B1	
10. $360 - 2 \times 37$ $= 286(^{\circ})$		M1 A1	SC1 for sight of 74(^{\circ}).
11. $\frac{BD \times 5}{2} = 35$  BD = 14(cm)  $\cos x = \frac{14}{32}$  $x = \cos^{-1} 0.4375$ $x = 64(^{\circ})$  Organisation and Communication.          Accuracy of writing.	✓  ✓  ✓ ✓ ✓  ✓  ✓	M1  A1  M1  m1 A1  OC1  W1	May be seen on the diagram. <u>Note</u> : If they state that AB = 14cm, or indicate on the diagram that AB = 14cm then it is M0A0 as an incorrect method used for area of a right-angled triangle (however an unattached 14cm has to be given the benefit of the doubt and be awarded M1A1). FT 'their stated or shown length BD'. FT has to use 'their BD' (not CD).  Accept answer rounded or truncated. [e.g. if their BD = 7, then accept 77(.36...^{\circ})]  For OC1, candidates will be expected to: <ul style="list-style-type: none"> <li>• present their response in a structured way</li> <li>• explain to the reader what they are doing at each step of their response</li> <li>• lay out their explanation and working in a way that is clear and logical</li> </ul> For W1, candidates will be expected to: <ul style="list-style-type: none"> <li>• show all their working</li> <li>• make few, if any, errors in spelling, punctuation and grammar</li> <li>• use correct mathematical form in their working</li> <li>• use appropriate terminology, units, etc.</li> </ul>





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17. $-(\sqrt[3]{w})^5$ $-\frac{3}{5}w$ $-(\sqrt[5]{w})^3$ $\frac{1}{(\sqrt[3]{w})^3}$ $\frac{1}{(\sqrt[3]{w})^5}$		B1	
18. $x(5x - 3) = 7$ OR $7 = x(5x - 3)$ OR $5x^2 - 3x = 7$ OR $7 = 5x^2 - 3x$ $5x^2 - 3x - 7 = 0$  $x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4 \times 5 \times (-7)}}{2 \times 5}$  $= (3 \pm \sqrt{149})/10$ $x = 1.52$ with $x = -0.92$ (answers to 2dp)	✓ ✓  ✓  ✓ ✓	M1 A1  M1  A1 A1	'= 0' required, but may be implied by an attempt to use the quadratic formula or if $a = 5, b = -3, c = -7$ used in the quadratic formula.  FT 'their quadratic equation' of equivalent difficulty (3 terms with at least one negative term). Allow one slip in substitution, but must be correct formula.  CAO for their quadratic equation. If none of the last 3 marks awarded for solving the <u>given equation</u> or the <u>correct quadratic</u> (irrespective if any of the opening two marks awarded), and trial and improvement used, then award: SC3 for <u>both</u> correct solutions given, correct to 2 decimal places: $x = 1.52$ with $x = -0.92$ , OR SC2 for <u>both</u> correct solutions given, but correct to 3 (or more) decimal places: $x = 1.520(6\dots)$ with $x = -0.920(6\dots)$ Note: no marks to be awarded for 1 correct solution from trial and improvement.
19.(a) Appropriate example: E.g. $\pi \times \pi = \pi^2$ , $(1 + \sqrt{3})^2 = 4 + 2\sqrt{3}$ $(\sqrt[3]{2})^2 = \sqrt[3]{4}$ OR $2^{\frac{2}{3}}$		B1	The following can be applied if <u>sight of <math>\pi</math></u> in the working lines or answer space: If $\pi$ or 3.141... (with or without the '...') used AND either $\pi^2$ or 9.8696... (with or without the '...') seen in the answer space, this will gain the B1. However, watch out for $\pi$ seen, and e.g. 3.141 and 9.8658 offered in the answer spaces. This gains B0 because $3.141^2$ has been evaluated (not $\pi^2$ ).
19.(b) Two different irrational numbers and the correct rational number as the answer.  Examples:  $\sqrt{2} \times \sqrt{8} = \sqrt{16}$ (or simplified to 4)  $\sqrt{12} \times \frac{1}{\sqrt{3}} = \frac{\sqrt{12}}{\sqrt{3}}$ (or simplified to 2)  $\pi \times \frac{1}{\pi} = 1$  $2^{\frac{1}{2}} \times 2^{\frac{3}{2}} = 2^2$ (answer can be simplified to 4)		B1	Answers in the boxes take precedence.

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<p>20.</p> <p> <math>y = f(x) - 2</math>  <math>y = f(x+2)</math>  <math>y = -f(x)</math>  <math>y = 2f(x)</math>  <math>y = f(2x)</math>  <math>y = f(x) \pm 2</math>  <math>y = \frac{1}{2}f(x)</math>  <math>y = f(x-2)</math> </p>		<p>B1</p> <p>B1</p> <p>B1</p> <p>B1</p>	
<p>21. Attempt to find the base diagonal</p> <p><math>[\text{'Their face diagonal'}]^2 + [\text{'Their edge'}]^2 = 20^2</math></p> <p><math>x^2 + x^2 + x^2 = 400</math> OR <math>3x^2 = 400</math> OR  <math>x^2 = 400/3</math> OR equivalent.</p> <p><math>x = \sqrt{400/3}</math> OR 11.5(4700538...cm)</p>	<p>✓</p> <p>✓</p> <p>✓</p> <p>✓</p>	<p>S1</p> <p>B1</p> <p>M1</p> <p>A1</p>	<p>e.g. diagonal<sup>2</sup> = <math>x^2 + x^2</math> or <math>x^2 + x^2 = 2x^2</math>.</p> <p>Clear attempt at connecting their indicated face diagonal and edge of cube with the internal diagonal. This mark implies S1.</p> <p>Correct equation connecting edges and internal diagonal. This mark implies S1 B1.</p> <p>CAO</p> <p>SC2 for an answer of 11.5(...cm) from a correct trial and improvement method, OR SC2 for an unsupported 11.5(...cm)</p> <p>SC1 for two correct evaluations of <math>11 \leq x \leq 12</math> from a correct trial and improvement method with one <math>&lt; 400</math> and one <math>&gt; 400</math>.</p>