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**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education**

# MARK SCHEME for the October/November 2010 question paper for the guidance of teachers

# 0580 MATHEMATICS

**0580/23** Paper 2 (Extended), maximum raw mark 70

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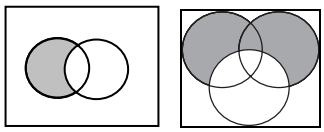
**Abbreviations**

cao correct answer only
cso correct solution only
dep dependent
ft follow through after error
isw ignore subsequent working
oe or equivalent
SC Special Case
www without wrong working

| Qu. | Answers | Mark | Part Marks |
|---|---|---|---|
| **1** | –8.3 | 1 | Allow $-8\frac{3}{10}$ |
| **2** | 21 55 | 1 | Allow 9.55 pm |
| **3** | 1.6305 cao | 2 | **B1** 4.33(44…) seen or answer 1.63, 1.630, 1.6304…. |
| **4** |  | 1, 1 | |
| **5** | Correct working | 2 | **M1** $\frac{15}{4}+\frac{4}{3}=\frac{45}{12}+\frac{16}{12}$<br>**M1** $\frac{61}{12}=5\frac{1}{12}$ |
| **6** | $4.93\% < \frac{20}{41} < 0.492 < \frac{80}{161}$ | 2 | Allow decimal equivalents in answer space<br>**M1** decimals 0.48(78..), 0.496(8..), 0.0493 |
| **7** | 1.14 | 2 | **M1** 3.38 ÷ 1.04 (= 3.25)<br>or **M1** 4.39 × 1.04 |
| **8** | 1200 | 2 | **M1** figs 8 ÷ 40 × figs 9 ÷ 15<br>or **M1** (figs 8 × figs 9) ÷ (40 × 15) |
| **9** | 9.6 cao | 2 | **M1** $\frac{x}{8}=\frac{12}{10}$ oe |
| **10** | 216.32 cao | 2 | **M1** $200 \times (1 + (4/100))^2$ oe |
| **11** | 13 | 2 | **M1** 21 + 15 – 23<br>or **M1** $15 - x + x + 21 - x + 1 = 24$ oe |
| **12** | **(a)** 25<br>**(b)** 0.4 | 1<br>1 | If zero scored **SC1** for 250 and 4 or 6.25 and 6.35 |
| **13** | $10a + b$ or $a \times 10^1 + b\ (\times 10^0)$ | 2 | **M1** $[a \times 10^7 + b \times 10^6] \div 10^6$ |

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|---|---|---|---|
| **14** | 10.8 or $10\frac{70}{83}$ | 3 | **M1** figs 10 ÷ time<br>**M1** 10 ÷ 0.92r, 0.922 or 83/90 |
| **15** | $y = -2x + 8$ cao oe | 3 | **M1** $(m =)\ \frac{8-2}{0-3}$ oe **B1** $c = 8$ or $y = mx + 8$<br>or subst. correct point in $y =$ "$m$" $x + c$ |
| **16** | $\frac{4h}{g^2}$ or $h\left(\frac{2}{g}\right)^2$ | 3 | **M1** squaring correctly<br>**M1** clearing denominator correctly<br>**M1** dividing by coefficient of $i$<br>or **SC2** for correct unsimplified expression |
| **17** | $x = -1,\ y = 5$ | 3 | **M1** consistent multiplication and either add or subtract<br>**A1** for one correct after **M1** |
| **18** | 315 | 3 | **M1** $\frac{x}{360} \times 2 \times \pi \times 8$ oe<br>**M1** $\frac{x}{360} \times 2 \times \pi \times 8\ (+ 16) = (16 +)\ 14\pi$ |
| **19** | 2.88 | 3 | **M1** $40^3$ oe seen **A1** 2 880 000<br>**B1ft** their 2 880 000 ÷ $100^3$<br>or **B1** 0.000045 **M1** $40^3$ **A1** cao<br>or **M1** $0.4^3$ **M1** $45 \times 0.4^3$ **A1** |
| **20** | **(a)** 63.4<br><br>**(b)** Vertices at (4, 1), (8, 1) and (10, 3) | 2<br><br>2 | **M1** $\tan(M) = \frac{4}{2}$ oe<br><br>**B1** two vertices correct |
| **21** | **(a)** 2.4 oe<br><br>**(b)** 680 | 1<br><br>3 | <br><br>**M1** an area found<br>**M1** $40 \times 20 - \frac{1}{2} \times 20 \times 12$ oe |
| **22** | $y \geqslant 1,\ x \leqslant 3, y \leqslant x + 5$ oe | 5 | **B1** $y$ R 1<br>**B1** $x$ R 3<br>**B2** $y$ R $x + 5$ or **B1** $y$ R $-x + 5$<br>where R is any inequality<br>**B1** all 3 inequalities correct |
| **23** | **(a)** (Angles in) same segment<br><br>**(b) (i)** 100<br>**(ii)** 43<br><br>**(iii)** 3 | 1<br><br>1<br>1<br><br>2 | Allow (angles on) the same arc<br><br><br><br>**B1** $OBC$ or $OCB = \frac{1}{2}(180 - 86)\ (= 47)$ |

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|---|---|---|---|
| **24** | **(a)** $\frac{x-2y}{xy}$ | 2 | **B1** correct numerator<br>**B1** correct denominator |
| | **(b)** $\frac{x}{3}$ www | 3 | **M1** $x(x+1)$ **M1** $3(x+1)$ |
| **25** | **(a)** –3 | 2 | **B1** $g(\frac{1}{2}) = 2$ or $fg(x) = \frac{2}{x} - 7$ oe |
| | **(b)** $\frac{1}{2x-7}$ | 1 | |
| | **(c)** $\frac{x+7}{2}$ | 2 | **M1** for $y + 7 = 2x$ or $x = 2y - 7$ |

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