**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**International General Certificate of Secondary Education**

# MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

# 0607 CAMBRIDGE INTERNATIONAL MATHEMATICS

**0607/02** Paper 2 (Extended), maximum raw mark 40

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

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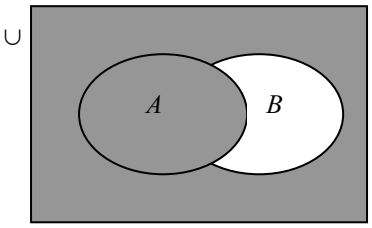
| | | | |
|---|---|---|---|
| **1 (a)** | $3.75 \times 10^{14}$ | **1** | |
| **(b)** | 1.8(0) | **2** | **M1** for $0.75 \times 2.4$ or complete equivalent method |
| **(c)** | –3, 1 | **B1, B1** | If **B0**, **M1** for $x + 1 = \pm 2$ |
| **2 (a) (i)** | 7 | **1** | |
| **(ii)** | 4 | **1** | |
| **(b)** |   | **1** | |
| **3** | $-\frac{3x}{4} + 3$ o.e. | **2** | **M1** for $4y = 12 - 3x$ or $\frac{3x}{4} + y = \frac{12}{4}$ |
| **4** | 36 | **2** | **M1** for $\frac{4}{3}\pi \times 3^3$ |
| **5 (a)** | $5\sqrt{5}$ | **1** | |
| **(b)** | $\frac{\sqrt{6}+\sqrt{3}}{3}$ o.e. | **2** | **M1** for intention to $\times \frac{\sqrt{6}+\sqrt{3}}{\sqrt{6}+\sqrt{3}}$ |
| **6 (a)** | 192 | **1** | |
| **(b)** | 768 | **1** | |
| **(c)** | $3 \times 2^n$ o.e. $6 \times 2^{n-1}$, $2^{n+2} - 2^n$ | **2** | **M1** for power of 2 in terms of $n$ in answer and not spoiled |

| | | | |
|---|---|---|---|
| **7 (a)** | $(x - 6)(x + 4)$ | **2** | **SC1** for $(x + a)(x + b)$ where $ab = -24$ or $a + b = -2$ |
| **(b)** | $x(y - 2z)(y + 2z)$ | **2** | **SC1** for $x(y^2 - 4z^2)$ or $(xy - 2xz)(y + 2z)$ or $(y - 2z)(xy + 2xz)$ |
| **8 (a)** | $-\mathbf{p} + \mathbf{q}$ or $\mathbf{q} - \mathbf{p}$ | **1** | |
| **(b)** | $\frac{1}{4}\mathbf{p} + \frac{3}{4}\mathbf{q}$ o.e. (in simplest form) | **2** | **M1** for $\overrightarrow{OR} = \overrightarrow{OQ} + \overrightarrow{QR}$ or $\overrightarrow{OP} + \overrightarrow{PR}$ s.o.i. |
| **9** | $\frac{4}{27}$ o.e. | **2** | **M1** for $\frac{4}{6} \times \frac{4}{6} \times \frac{2}{6}$ o.e. |
| **10** | 7 | **3** | **M1** for multiplying all three terms by 6 or all over 6 or left hand side over 6 = 9<br>**A1** for $2(2x + 1) + 3(x + 1) = 54$ or $\frac{7x + 5}{6} = 9$<br>7 may be seen correctly embedded – accept |
| **11 (a)** | 2 | **2** | **M1** for $p^3 = 8$ |
| **(b)** | $q = 2$, $r = 3$ | **3** | **M1** for use of $\log ab = \log a + \log b$ or $\log a^b = b \log a$<br>**M1** dep for log 12 and log 9 in terms of log2 and log3 only, or $\log 2^2 + \log 3^3$ seen, or $108 = 2^q \times 3^r$ |
| **12 (a)** | $F = 8v^2$ | **2** | **M1** for $F = kv^2$ o.e. $k \neq 1$ |
| **(b) (i)** | 32 | **1 ft** | ft their **(a)** only if $kv^2$ $k \neq 1$ |
| **(ii)** | 11 | **1 ft** | ft their **(a)** only if $kv^2$ $k \neq 1$ |