

CAMBRIDGE INTERNATIONAL EXAMINATIONS

Cambridge International General Certificate of Secondary Education

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MARK SCHEME for the May/June 2015 series

0444 MATHEMATICS (US)

0444/21

Paper 2, maximum raw mark 70

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Abbreviations

- cao correct answer only
- dep dependent
- FT follow through after error
- isw ignore subsequent working
- oe or equivalent
- SC Special Case
- nfww not from wrong working
- soi seen or implied

| Qu. | Answers | Mark | Part Marks |
|--------|---|------|---|
| 1 | 9.5 | 1 | |
| 2 | 0.0001 oe | 1 | |
| 3 | $2x^2 + 8x - 35$ final answer | 2 | B1 for 2 correct terms in answer or M1 for $2x^2 + 3x$ or $5x - 35$ |
| 4 | Paul and correct reason with 28% oe shown or conversion of 26% to fraction and common denominator | 2 | B1 for $\frac{7}{25}$ seen as decimal or % (0.28) or conversion of 26% to fraction and common denominator |
| 5 | $24u^2w^3$ final answer | 2 | B1 for 2 correct elements in final answer |
| 6 | $5\sqrt{3}$ | 2 | B1 for $[\sqrt{12} =] 2\sqrt{3}$ or $[\sqrt{27} =] 3\sqrt{3}$ |
| 7 | 10 | 3 | M2 for $\sqrt{(7--1)^2 + (11-5)^2}$ oe or M1 for $(7--1)$ oe or $(11-5)$ oe |
| 8 | $\frac{5}{21}$ cao | 3 | B1 for $\frac{9}{5}$ or $\frac{5}{9}$ or $\frac{63}{35}$ or $\frac{35}{63}$ M1 for $\frac{3}{7} \times their \frac{5}{9}$ or $\frac{15}{35} \div \frac{63}{35}$ oe |
| 9 (a) | 2 | 1 | |
| (b) | 8 | 2 | M1 for $4^{\frac{3}{2}}$ or $\left(\frac{1}{2}\right)^{-3}$ or $\left(\frac{1}{64}\right)^{-\frac{1}{2}}$ |
| 10 (a) | $4n$ oe final answer | 1 | |
| (b) | $3n^2 + 8$ oe final answer | 2 | M1 for a quadratic expression as final answer or $3n^2 + 8$ oe in working |

| | | | |
|--------|--|-----|--|
| 11 | 18 | 3 | <p>M2 for $2(2 + 4)^2 = p(-2 + 4)^2$ oe</p> <p>M1 for $p = \frac{k}{(q + 4)^2}$</p> <p>A1 for $k = 72$</p> |
| 12 (a) | 5 | 2 | M1 for $18 \times \frac{1000}{60 \times 60}$ oe |
| (b) | 54 | 1FT | FT 270 ÷ their (a) |
| 13 (a) | 2b | 1 | <p>SC1 for answer trapezoid with reason <i>PM</i> parallel to <i>QR</i></p> |
| (b) | Parallelogram | 1 | |
| | <p><i>PM</i> equal and parallel to <i>QR</i></p> <p>or</p> <p><i>PM</i> or <i>PS</i> parallel to <i>QR</i></p> <p>and <i>MR</i> found = a so 2 pairs of parallel sides</p> | 1 | |
| 14 | <p>$y < 8$</p> <p>$y \geq 6 - x$ oe and $y \geq x + 2$ oe</p> | 1 | <p>B2 for either $y \geq 6 - x$ oe or $y \geq x + 2$ oe or</p> <p>SC2 for $y = 6 - x$ oe and $y = x + 2$ oe</p> <p>or SC1 for $y > 6 - x$ or $y = 6 - x$ or $y > x + 2$ or $y = x + 2$</p> |
| | | 3 | |
| 15 | 5300 | 3 | <p>B2 for 300</p> <p>or M2 for $5000 + \frac{5000 \times 2 \times 3}{100}$ oe</p> <p>or M1 for $\frac{5000 \times 2 \times 3}{100}$ oe</p> |
| 16 (a) | $2 \times 3 \times 5$ | 2 | B1 for 2, 3, 5 as prime factors |
| (b) | 90 | 2 | <p>B1 for $90k$</p> <p>or $2 \times 3 \times 3 \times 5$</p> <p>or for listing multiples of each up to 90</p> |
| 17 | <p>$x = 3$</p> <p>$y = -1$</p> | 4 | <p>M1 for correctly equating one set of coefficients</p> <p>M1 for correct method to eliminate one variable</p> <p>A1 $x = 3$</p> <p>A1 $y = -1$</p> <p>If zero scored SC1 for 2 values satisfying one of the original equations</p> |

| | | | |
|--------|---------------------------------|--------------|--|
| 18 (a) | 7.5 oe | 2 | M1 for $[10] \times \frac{6}{8}$ oe |
| (b) | 18 | 2 | M1 for $\left(\frac{6}{8}\right)^2$ or $\left(\frac{8}{6}\right)^2$ oe or $\frac{32 \times 2}{8} \times \frac{6}{8}$ or $\frac{32 \times 2}{10} \times \frac{6}{8}$ |
| 19 (a) | $(p+t)(y+2x)$ final answer | 2 | B1 for $y(p+t)+2x(p+t)$ or $p(y+2x)+t(y+2x)$ |
| (b) | $7(h+k)(h+k-3)$ final answer | 2 | B1 for $7((h+k)^2-3(h+k))$ or $(h+k)(7(h+k)-21)$ |
| 20 | 45π | 3 | M1 for $\frac{1}{3} \times \pi \times 3^2 \times 9$ (27π) M1 for $\frac{1}{2} \times \frac{4}{3} \times \pi \times 3^3$ (18π) or SC2 for final answer 63π or $141.3\dots$ |
| 21 (a) | 2.3×10^{12} | 2 | M1 for 20×10^{11} or 0.3×10^{12} seen or correct answer not in scientific notation e.g. 23×10^{11} or $2\,300\,000\,000\,000$ |
| (b) | $a+100b$ or $a+b \times 10^2$ | 1 | |
| 22 | F C A E | 1, 1 1, 1 | |
| 23 (a) | -13 | 1 | |
| (b) | $-3x-1$ or $5-3(x+2)$ | 1 | |
| (c) | $9x-10$ | 2 | M1 for $5-3(5-3x)$ |
| (d) | $\frac{5-x}{3}$ final answer oe | 2 | M1 for correct first step e.g. $y+3x=5$ or $\frac{y}{3}=\frac{5}{3}-x$ or $y-5=-3x$ or better or for interchanging x and y e.g. $x=5-3y$, this does not need to be the first step |