

# Gold Level

## Mark Scheme 6

|                  |               |
|------------------|---------------|
| Level            | IGCSE         |
| Subject          | Maths         |
| Exam Board       | Edexcel       |
| Difficulty Level | Gold          |
| Booklet          | Mark Scheme 6 |

**Time Allowed:** 57 minutes

**Score:** /47

**Percentage:** /100

**Grade Boundaries:**

|      |     |     |     |     |     |     |     |      |
|------|-----|-----|-----|-----|-----|-----|-----|------|
| 9    | 8   | 7   | 6   | 5   | 4   | 3   | 2   | 1    |
| >85% | 75% | 65% | 55% | 45% | 35% | 25% | 15% | <15% |

| Question Number | Working  | Answer              | Mark | Notes   |
|-----------------|--|---------------------|------|---|
| 1.              | $36 - 6\sqrt{8} - 6\sqrt{8} + 8$ or $36 - 12\sqrt{8} + 8$<br>$44 - 12\sqrt{(4 \times 2)}$<br>$44 - 12\sqrt{4 \times 2}$      | $44 - 24\sqrt{2}^*$ | 3    | M2 M1 for $6^2 + (\sqrt{8})^2$ or $36 + 8$ or $6^2 + \sqrt{64}$ or $-12\sqrt{8}$ or $-6\sqrt{8} - 6\sqrt{8}$  |
|                 | LHS = $(6 - 2\sqrt{2})^2$ or $\sqrt{8} = 2\sqrt{2}$<br>$6^2 - 12\sqrt{2} - 12\sqrt{2} + 4 \times 2$ or $36 - 24\sqrt{2} + 8$ |                     |      | M1 for $(-12)\sqrt{8} = (-12) \times 2\sqrt{2}$ or $\sqrt{8} = 2\sqrt{2}$ or $6\sqrt{8} = 6 \times 2\sqrt{2}$<br>Must see $\sqrt{8}$ stated as $2\sqrt{2}$ for final M1<br>Alt:<br>M1<br>M2 M1 for $6^2 + 4 \times 2$ or $36 + 8$ |
|                 |  |                     |      | <b>Total 3 marks</b>  |

| Question Number | Working  | Answer          | Mark | Notes   |
|-----------------|--|-----------------|------|---|
| 2.              | $\frac{5(x-2)+9(x+2)}{(x+2)(x-2)} (=2)$ $14x + 8 = 2(x + 2)(x - 2) \text{ or } \frac{14x+8}{(x-2)(x+2)} (=2)$ $2x^2 - 14x - 16 (= 0) \text{ oe}$ $x^2 - 7x - 8 (= 0) \text{ oe}$ $(x + 1)(x - 8) (= 0) \text{ oe}$ | $x = -1, x = 8$ | 5    | M1 correct expression with correct common denominator or $5(x - 2) + 9(x + 2) = 2(x + 2)(x - 2)$<br>M1 gather terms correctly. Accept $x^2 - 4$ for $(x + 2)(x - 2)$<br>A1 correct 3 part quadratic<br>M1 or $\frac{7 \pm \sqrt{7^2 - 4 \times 1 \times -8}}{2}$ oe condone 1 sign error<br>A1 dep on previous M1 |
|                 |  |                 |      | <b>Total 5 marks</b>  |
| 3.              | $\pi r^2 \times 4r - 2 \times 4\pi r^3/3 = 125\pi/6 \text{ oe}$ $24 r^3 - 16 r^3 = 125 \text{ oe}$ $r^3 = 125/8 \text{ oe}$ $r = \sqrt[3]{(125/8)}$  | $2.5$           | 5    | M2 Any equation based on cylinder – 2 spheres = space oe<br>h = 4r must be implicit for award of M2<br>{decimal form: $12.6r^3 - 8.4r^3 = 65.4$ (1 dp or better)}<br>If not M2 then M1 for $\pi r^2 \times 4r$ or better<br>M1 One occurrence of $r^3$ in correct equation.<br>M1<br>A1 awrt to 2.5 Ans dep on M3 |
|                 |  |                 |      | <b>Total 5 marks</b>  |

|         |                                  |  |    |   |  |
|---------|----------------------------------|--|----|---|--|
| 4. (i)  | 5 x 8                            |  | 40 | 2 | M1 Or any correct fd marked on vertical axis (2, 4 etc) with no errors<br>or 1 square = 4 students<br>A1 |
| 4. (ii) | Missing blocks = 5cm, 6cm, 1.5cm |  |    | 2 | B2 3 correct blocks<br>If not B2 then B1 for 1 or 2 correct blocks                                       |
|         |                                  |  |    |   | <b>Total 4 marks</b>   |

|        |   |  |        |   |  |
|--------|---|--|--------|---|--|
| 5. (a) | Black circle = 0.3 White region = 0.6<br>All values “correct” for second shot   |  |        | 3 | B1 B1<br>B1ft Allow ft if each group of 3 branches on second arrow all sum to 1 and are consistent with first arrow branches |
| 5. (b) | Any one correct product in numerical form<br>e.g. (“0.3” x 0.1) or<br>(0.1 x “0.3”) or (“0.6” x “0.6”)<br><br>(“0.3”x 0.1) + (0.1x “0.3”) + (“0.6” x “0.6”) |  | 0.42oe | 3 | M1ft e.g. (Black, Miss) or (Miss, Black) or (White, White)<br><br>M1ft 3 “correct” products with intention to add<br>A1 cao  |
|        |   |  |        |   | <b>Total 6 marks</b>   |

|    |   |                             |   |   |
|----|---|-----------------------------|---|---|
| 6. | $\frac{(2x - 5)(2x + 5)}{(2x + 5)(3x - 1)}$ | $\frac{(2x - 5)}{(3x - 1)}$ | 3 | M2 If not M2 then M1 for numerator or denominator correct<br>A1 |
|    |   |                             |   | <b>Total 3 marks</b>  |

|               |   |               |   |                                   |
|---------------|---|---------------|---|-----------------------------------|
| 7.<br>(a) (i) |   | $16x$         | 1 | B1                                |
| (a)<br>(ii)   | $2x^{-1}$   | $-2x^{-2}$ oe | 2 | M1<br>A1                          |
| (b)           | $"16x" + "-2/x^2" = 0$<br>$16x = 2/x^2$<br>$x^3 = 1/8$<br>$x = 1/2$ | $(1/2, 6)$    | 4 | M1<br>M1 $x^3$ isolated<br>A1, A1 |
|               |   |               |   | <b>Total 7 marks</b>              |

|           |   |   |   |  |
|-----------|---|---|---|--|
| 8.        |   | $2\mathbf{a}$ oe                                  | 1 | B1   |
| (a) (i)   |   |   |   |  |
| (a) (ii)  |   | $2\mathbf{a} + \mathbf{b}$ oe                     | 1 | B1   |
| (a) (iii) |   | $-\mathbf{a} + \mathbf{b}$ oe                     | 1 | B1   |
| (b)       | $\vec{PN} = \mathbf{a} + 1/3$ (“ $-\mathbf{a} + \mathbf{b}$ ”)<br>$\vec{PN} = 2\mathbf{a}/3 + \mathbf{b}/3$ {= $1/3 (2\mathbf{a} + \mathbf{b})$ }     | $\rightarrow \rightarrow$<br>stating $PN = PR/3$  | 2 | M1ft from (a)(iii) i.e. a valid path from P to N, or N to P, using lower case letters.<br><br>A1 Arrows not necessary. Dependent on M1 |
|           | $\vec{NR} = 2/3$ (“ $-\mathbf{a} + \mathbf{b}$ ”) + $2\mathbf{a}$<br>$\vec{NR} = 4\mathbf{a}/3 + 2\mathbf{b}/3$ {= $2/3 (2\mathbf{a} + \mathbf{b})$ } | $\rightarrow \rightarrow$<br>stating $NR = 2PR/3$ |   |  |
|           |   |   |   | <b>Total 5 marks</b>   |

|    |  |      |   |  |
|----|--|------|---|--|
| 9. | $\sqrt{(16^2 + 10^2)}$ (=18.9 or better)<br>“18.867” $\div 2$ (=9.433)<br>$\tan “x” = 15/ “9.433”$ | 57.8 | 4 | M1 or M2 for $\sqrt{(8^2 + 5^2)}$ (=9.43 or better)<br>M1 dep on previous M1<br>M1 dep on M2<br>A1 57.832..... awrt 57.8 |
|    |  |      |   | <b>Total 4 marks</b>   |

|            |     |  |   |    |  |
|------------|-----|--|---|----|--|
| <b>10.</b> | (a) | 4 12 28 60 132 160                           | 1 | B1 | cao  |
|            | (b) |  | 2 | B1 | $\pm \frac{1}{2}$ sq ft from sensible table<br>ie clear attempt to add frequencies   |
|            |     | Curve or line segments                       |   | B1 | ft from points if 4 or 5 correct or if all points are plotted consistently within each interval at the correct heights<br>Accept curve which is not joined to the origin |
|            | (c) | 80 (or 80.5) indicated on cf graph or stated | 2 | M1 | for 80 (or 80.5) indicated on cf axis or stated  |
|            |     |  |   | A1 | If M1 scored, ft from cf graph<br>If no indication of method, ft only from correct curve & if answer is correct ( $\pm \frac{1}{2}$ sq tolerance) award M1 A1            |
|            |     |  |   |    | <b>Total 5 marks</b>   |