# Proportion

## Mark Scheme

| Level | IGCSE |
|---|---|
| Subject | Maths |
| Exam Board | Edexcel |
| Topic | Equations, Formulae and Identities |
| Sub Topic | Proportion |
| Booklet | Mark Scheme |

**Time Allowed:** 29 minutes

**Score:** /22

**Percentage:** /100

**Grade Boundaries:**

| A* | A | B | C | D | E | U |
|---|---|---|---|---|---|---|
| >85% | 75% | 70% | 60% | 55% | 50% | <50% |

| 1. | $A = KT^2$ and $A = kr^3$ **or** $T^2 = \dfrac{k}{K} r^3$ **or** $T^2 = pr^3$ $r^3 = \dfrac{K}{k} T^2$ **or** $r^3 = qT^2$ | | 4 | M1 condone the same constant used in both equations **NB: Values may be substituted in place of the variables** |
|---|---|---|---|---|
| | $47^2 = \dfrac{k}{K} 0.25^3$ **or** $47^2 = m0.25^3$ **or** $\dfrac{47^2}{0.25^3} (=141376)$ **or** $\dfrac{0.25^3}{47^2} (= \dfrac{1}{141376} = 7.07(3...)\times 10^{-6})$ | | | M1 **NB: 2209 may be seen in place of $47^2$** $\dfrac{1}{64}$ or 0.015625 may be seen in place of $0.25^3$ |
| | $\left(r^3 =\right)\dfrac{0.25^3}{47^2}\times 365^2$ **or** $365^2 \div 141376$ **or** $365^2 \times 7.07(3...) \times 10^{-6}$ **or** $0.942...$ | | | M1 |
| | | 0.980 | | A1 awrt 0.980 accept 0.98 |
| | | | | **Total 4 marks** |

| 2. | (a) | $y = k\sqrt{x}$ or $cy = \sqrt{x}$ | | 3 | M1 | | M2 for $k = \dfrac{4}{7}$ |
| | | $4 = k \times \sqrt{49}$  or $4c = \sqrt{49}$ | | | M1 | | |
| | | | $y = \dfrac{4}{7}\sqrt{x}$ | | A1 | Accept $y = 0.571(1428)\sqrt{x}$ Note: Award M2A1 if answer given is $y = k\sqrt{x}$ with $k$ evaluated as $\dfrac{4}{7}$ in (a) or (b). | |
| | (b) | $12 = "\dfrac{4}{7}" \times \sqrt{x}$  $(\sqrt{x} = 21)$ | | 2 | M1 | Allow ft if M1 scored in (a) but not if $k = 1$ | |
| | | | 441 | | A1 | ft from $12 = "\dfrac{4}{7}" \times \sqrt{x}$ but not if $k = 1$ | |
| | | | | | | | **Total 5 marks** |

| Q | Working | Answer | Mark | Notes | |
|---|---|---|---|---|---|
| **3.** (a) | $(40 \div 16) \times 240$ oe | | | M1 | for a fully correct method |
| | | 600 | 2 | A1 | |
| (b) | $(600 \div 120) \times 16$ oe | | | M1 | for a fully correct method |
| | | 80 | 2 | A1 | |
| (c) | $240 \div 150$ **or** $150 : 240$ oe | | | M1 | |
| | | 1.6 oe | 2 | A1 | |
| | | | | | **Total 6 marks** |

| 4. | $Q = \dfrac{"k"}{t^2}$ | | 3 | M1 | $k$ must be a letter not a number |
|---|---|---|---|---|---|
| | $320 = \dfrac{"k"}{0.5^2}$  or "$k$" = 80 | | | M1 | for substitution (implies first M1) |
| | | $Q = \dfrac{80}{t^2}$ | | A1 | Award 3 marks for $Q = \dfrac{"k"}{t^2}$ and "$k$" = 80 stated anywhere |
| | | | | | **Total 3 marks** |

| 5. | (a) | $M = k \times p^3$ | | | M1 | For $M = kp^3$ or $p^3 = \frac{M}{k}$ oe <br> Do not allow $M = p^3$ oe |
| | | $128 = k \times 8^3$ | | | M1 | For a correct substitution into a correct equation. <br> Implies first M1. <br> Award M2 if $k = 0.25$ stated unambiguously in (a) or (b). |
| | | | $M = 0.25p^3$ | 3 | A1 | Award 3 marks if answer is $M = kp^3$ but $k$ is evaluated in part (b) |
| | (b) | | 31.25 | 1 | B1ft | for their value of $k$ only for equations of the form $M = kp^3$ oe and if $k \neq 1$ |
| | | | | | | **Total 4 marks** |