Hafaliadau Cyfrannedd

1.

Rydych chi'n gwybod bod p mewn cyfrannedd â q.
Pan fo p = 48 rydych chi'n gwybod bod q = 0·6.
Cyfrifwch

- gwerth p pan fo q = 12
- gwerth q pan fo p = 9·6 [4]

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Mae p = ... pan fo q = 12

Mae q = ... pan fo p = 9·6

4

2.

(a) Rydych chi'n gwybod bod $a = \frac{48}{b}$ a bod $b = \frac{3}{c}$.

Cyfrifwch werth a pan fo $c = 24$. [3]

(b) Rydych chi'n gwybod bod x mewn cyfrannedd ag y.
Pan fo $x = 4$, mae $y = 0{\cdot}8$.
Cyfrifwch werth x pan fo $y = 6$. [3]

3.

O wybod bod y mewn cyfrannedd wrthdro ag x, a bod $y = 50$ pan fo $x = 2$,

(a) darganfyddwch fynegiad ar gyfer y yn nhermau x, [3]

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(b) defnyddiwch y mynegiad gwnaethoch chi ei ddarganfod yn *(a)* i gwblhau'r tabl canlynol. [2]

x	$\frac{1}{2}$	2	
y		50	12·5

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4.

O wybod bod y mewn cyfrannedd wrthdro ag x, a bod $y = 4$ pan fo $x = 3$,

(a) darganfyddwch fynegiad ar gyfer y yn nhermau x, [3]

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(b) defnyddiwch y mynegiad rydych chi wedi ei ddarganfod yn *(a)* i gwblhau'r tabl canlynol. [2]

x	3	0·25	
y	4		$\frac{1}{5}$

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5.

O wybod bod y mewn cyfrannedd wrthdro ag x^2, a bod $y = 10$ pan fo $x = 6$, darganfyddwch werthoedd x pan fo $y = 4$. [5]

6.

O wybod bod y mewn cyfrannedd wrthdro ag x^2, a bod $y = 10$ pan fo $x = 12$, darganfyddwch fynegiad ar gyfer y yn nhermau x.

[3]

7.

(a) Rydych chi'n gwybod bod y mewn cyfrannedd wrthdro ag x^2, a bod $y = 50$ pan fo $x = 3$. Darganfyddwch fynegiad ar gyfer y yn nhermau x. [3]

(b) Defnyddiwch y mynegiad rydych chi wedi ei ddarganfod yn *(a)* i gwblhau'r tabl canlynol. [1]

x	$\frac{1}{2}$	3
y		50

8.

O wybod bod y mewn cyfrannedd wrthdro â x^2, a bod $y = 8$ pan fo $x = 0{\cdot}5$,

(a) darganfyddwch fynegiad ar gyfer y yn nhermau x,

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[3]

(b) defnyddiwch y mynegiad y gwnaethoch ei ddarganfod yn *(a)* i gwblhau'r tabl canlynol.

x		0·2	0·5
y	800		8

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[2]

9.

Rydych chi'n gwybod bod y mewn cyfrannedd wrthdro ag x^3, a bod $y = 2$ pan fo $x = 2$.

(a) Darganfyddwch fynegiad ar gyfer y yn nhermau x. [3]

(b) Cyfrifwch y pan fo $x = -4$. [1]

(c) Cyfrifwch x pan fo $y = 0{\cdot}016$. [2]

10.

O wybod bod g mewn cyfrannedd union â t^2, a bod $g = 450$ pan fo $t = 7{\cdot}5$,

(a) darganfyddwch fynegiad ar gyfer g yn nhermau t,

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[3]

(b) defnyddiwch y mynegiad rydych chi wedi ei ddarganfod yn *(a)* i gwblhau'r tabl canlynol.

g		450	800
t	2·5	7·5	

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[2]

11.

O wybod bod p mewn cyfrannedd wrthdro ag r^2, a bod $p = 6$ pan fo $r = 3$, darganfyddwch fynegiad ar gyfer p yn nhermau r. [3]

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12.

Mae perthynas rhwng x ac y.
Mae'r tabl yn dangos rhai gwerthoedd y ar gyfer nifer o werthoedd x.

x	1	2	4
y	200	100	50

(a) Ysgrifennwch berthynas rhwng x ac y drwy gwblhau'r gosodiad canlynol. [2]

$y =$

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(b) Ysgrifennwch werth y pan fo $x = 25$. [1]

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13.

Mae gan ffermwr ddigon o fwyd yn union i fwydo x o foch am y o ddiwrnodau.

(a) Ysgrifennwch fynegiad ar gyfer nifer y diwrnodau y gallai'r ffermwr fwydo z o foch gyda'r un maint o fwyd.

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[2]

(b) Ysgrifennwch dybiaeth *(assumption)* rydych chi wedi ei gwneud wrth ateb rhan *(a)*.

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[1]

Cynllun Marcio

1.

(Scale factor =) 48/0.6 (=80) OR 0.6/48(= 0.0125) OR p = kq with 48 = k×0.6 or *q*=kp with 0.6 = k×48 OR equivalent	M1	
EITHER a method to find *p* OR a method to find *q* (*p* =) 12 × (48/0.6) OR 12 / (0.6÷48) OR equivalent (12× 80 or 48 × 20 or 12 / 0.0125) OR (*q* =) 9.6÷ (48/0.6) OR 9.6/(48÷0.6) OR equivalent (9.6 ÷ 80 or 0.2 × 0.6 or 9.6 × 0.0125)	M1	Allow M1 for correct substitution for their SF in their proportion equation, or for a reversed substitution in their proportion equation correctly evaluated Award of this M1 implies also the award of previous M1
(*p* =) 960 (q =) 0.12	A1 A1 4	CAO CAO *Sight of answers p = 0.15, q = 768 (p & q swapped):* *award SC2 for p = 0.15 (from 0.6 ÷ 4)* ***and*** *q = 768 (from 48 ×16),* *or* *SC1 for either p = 0.15 (from 12/80) or q = 768 (from p = 80×0.96)*

2.

9.(a) (b =) 3/24 (=1/8) (a =) 48 / $^1/_8$ or (a =) 48 × 8(/1) (a =) 384	M1 M1 A1	(a =) 48 / $^3/_{24}$ gains M2 FT 'their calculated b' CAO
(b) (Scale factor =) 4/0.8 (=5) OR 0.8/4 (= 0.2) OR *y* = k*x* with 0.8 = k×4 or *x*=k*y* with 4 = k×0.8 OR $\frac{x}{4} = \frac{6}{0.8}$ OR $\frac{x}{6} = \frac{4}{0.8}$	M1	
(*x* =) 6 × (4/0.8) OR 6 / (0.8÷4) (6 × 5) (6 / 0.2) = 30	M1 A1 6	Allow M1 for correct substitution for their SF in their proportion equation, or for a reversed substitution in their proportion equation correctly evaluated CAO A0 if left as 30 proportional to 6

3.

17(a) y α 1/x OR y = k/x 50 = k/2 y = 100/x	B1 M1 A1	 FT non linear only Maybe implied in part (b)
17(b) x: ½	2	**8** y: **200**	50	12.5	B2	FT their non linear expression B1 for each value

4.

(a) *y* α 1/*x* NEU *y* = k/*x* 4 = k/3 NEU k = 12 *y* = 12/*x*		B1 M1 A1	Caniatáu *y* α k/*x* Rhaid bod ar y ffurf gywir, nid dilyn trwodd. Mae M1 yn ymhlygu B1. Gall gael ei weld yn rhan (b). Caniatáu cywerthydd e.e. x = 12/y
(b) *x*: 3	0·25	**60** *y*: 4	**48**	1/5		B2	Dilyn trwodd aflinol yn unig. B1 am bob gwerth.

5.

$y \alpha 1/x^2$ OR $y = k/x^2$ $10 = k/6^2$ $y = 360/x^2$ or $k = 360$ $x^2 = 360/4$ or $x = (\pm)\sqrt{90}$ or $x = 9.4868..$ $x = \pm 9.4868\ldots$ or $\pm 3\sqrt{10}$	B1 M1 A1 M1 A1 5	Ignore use of incorrect symbol 'α' later FT $y \alpha 1/x$ or $y \alpha x^2$ FT 'their k' provided at least 1 mark previously awarded Accept rounded or truncated, but MUST be ±. No FT from 1/x as both solutions required

6.

$y \propto \frac{1}{x^2}$ OR $y = \frac{k}{x^2}$	B1
$k = 1440$	M1
$y = \frac{1440}{x^2}$	A1

7.

(a) $y \alpha 1/x^2$ OR $y = k/x^2$ $50 = k/3^2$ or $k = 50 \times 3^2$ or $k = 450$ $y = 450/x^2$ or $y = 450 \div x^2$	M1 M1 A1	Allow incorrect notation, e.g. $y \alpha k/x^2$ FT non linear only Do not accept $y \alpha 450/x^2$ Maybe stated in part (b)
(b) x: ½, 3 y: **1800**, 50	B1	FT their non linear expression

8.

12.(a) $y \alpha 1/x^2$ OR $y = k/x^2$ $8 = k/0.5^2$ $y = 2/x^2$	B1 M1 A1	 Must be in the correct form, not FT Maybe implied in part (b)
12.(b) x: **0.05**, 0.2, 0.5 y: 800, **50**, 8	B2	FT non linear only FT their non linear expression B1 for each value

9.

Ribbon marked. *(a)* $y = k \div x^3$ OR $y \alpha 1/x^3$ $2 = k \div 2^3$ or $k = 16$ $y = 16/x^3$		B1 M1 A1	
(b) −0·25		B1	FT in parts *(b)* and *(c)* for their non-linear expression from *(a)*.
(c) $x^3 = 16/0{\cdot}016$ (=1000) $(x =)$ 10		M1 A1	

10.

15(a) $g \alpha t^2$ or $g = kt^2$ $450 = k \times 7.5^2$ $g = 8t^2$	B1 M1 A1	Ignore incorrect use of '=' or 'α' throughout FT from non linear only May be implied in (b)
15(b) g: **50**, 450, 800 t: 2.5, 7.5, **(+) 10**	B2	B1 for each value. FT non linear expressions for SC1 only if both FT answers accurately evaluated

11.

16. $p = k/r^2$ or $p \alpha 1/r^2$ $6 = k/3^2$ $p = 54/r^2$		B1 M1 A1	FT for non-linear start only.

12.

Methods in Mathematics June 2015 Unit 2 Higher Tier	Mark	Comment
12.(a) $y = 200/x$	B2	B1 for $y = n/x$ (n is a whole number ≥ 1) or $xy = 200$, or sight of $k = 200$ (with $y = k/x$)
(b) (y =) 8	B1	FT from (a) provided their relationship shows inverse proportion
	3	

13.

13(a) xy/z OR x×y÷z	B2	B1 for sight of xy, x/z or y/z, this may be within an incorrect expression involving multiplication and division only, e.g. 'xyz', 'y/xz'
13(b) E.g. 'all pigs eat the same', 'same amount given to pigs each day'	E1	Must include idea of 'same' or 'equality'