HIGHER

7.7 Rearranging Harder Formulae: Test Pack

Total Marks

EDEXCEL 1MA1 · Calculator allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Work out x from $18 = 5x + x$.

(Total for Question 1 is 1 mark)

2 Make x the subject of $y = \sqrt{x} + 1$.

(Total for Question 2 is 2 marks)

3 Rearrange $R = (x + 3)/(2x)$ to make x the subject. Give your answer in simplest form.

(Total for Question 3 is 3 marks)

4 Rearrange $t = \sqrt{(2s)/g}$ to make s the subject.

(Total for Question 4 is 2 marks)

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5 Rearrange $m = \sqrt{(x + 4)/(2x)}$ to make x the subject. Give your answer in simplest form.

(Total for Question 5 is 3 marks)

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6 $1/c = 2/m + 1/n$. Make n the subject of the formula.

(Total for Question 6 is 4 marks)

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7 $y = (x + 3)^2 - 1$, where $x + 3 > 0$. Make x the subject of the formula.

(Total for Question 7 is 3 marks)

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8 Make x the subject of $y = (5x - 1)/(x + 6)$

(Total for Question 8 is 4 marks)

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9 $y = 2\sqrt{x - 4}$. Make x the subject of the formula.

(Total for Question 9 is 3 marks)

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10 Make x the subject of $3(x + y) = 4x + 8$

(Total for Question 10 is 3 marks)

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11 $1/c = 4/m + 1/n$. Make n the subject of the formula.

(Total for Question 11 is 4 marks)

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12 $y = 4\sqrt{x - 1}$. Make x the subject of the formula.

(Total for Question 12 is 3 marks)

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13 $y = (x - 4)^2 - 2$, where $x - 4 > 0$. Make x the subject of the formula.

(Total for Question 13 is 3 marks)

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14 Make x the subject of $4(x + y) = 6x + 8$

(Total for Question 14 is 3 marks)

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15 Rearrange $p = (x^2 + 2x)/(x - 1)$ to make x the subject. Give your answer using the quadratic formula.

(Total for Question 15 is 4 marks)

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Mark scheme · 7.7 Rearranging Harder Formulae: Test Pack

Question 1

x = 3 cao **B1**

Answer: 3

Question 2

isolate $\sqrt{x}$: $\sqrt{x}$ = y - 1 **M1**

$x = (y - 1)^2$ cao **A1**

Answer: $x = (y - 1)^2$

Question 3

multiply both sides by 2x to get 2R x = x + 3 **M1**

collect x terms to x(2R - 1) = 3 **M1**

x = 3/(2R - 1) cao **A1**

Answer: x = 3/(2R - 1)

Question 4

square both sides to get $t^2 = 2s/g$ **M1**

$s = g\ t^2/2$ cao **A1**

Answer: $s = g\ t^2/2$

Question 5

square both sides to get $m^2 = (x + 4)/(2x)$ and clear fraction to $2m^2\ x = x + 4$ **M1**

collect x terms to give $x(2m^2 - 1) = 4$ **M1**

$x = 4/(2m^2 - 1)$ cao **A1**

Answer: $x = 4/(2m^2 - 1)$

Question 6

1/n = 1/c - 2/m **M1**

combines into a single fraction **M1**

inverts both sides **M1**

n = cm/(m - 2c) oe **A1**

Answer: n = cm/(m - 2c)

Question 7

$y + 1 = (x + 3)^2$ **M1**

square roots **M1**

$x = \sqrt{y + 1}$ - 3 oe **A1**

Answer: $x = \sqrt{y + 1}$ - 3

Question 8

multiplies both sides by the denominator **M1**

expands the bracket **M1**

collects x terms on one side and factorises **M1**

x = (6y + 1)/(5 - y) oe **A1**

Answer: x = (6y + 1)/(5 - y)

Question 9

divides by 2 **M1**

squares both sides **M1**

$x = (y/2)^2 + 4$ oe **A1**

Answer: $x = (y/2)^2 + 4$

Question 10

expands the bracket **M1**

collects x terms on one side **M1**

x = (8 - 3y)/(-1) oe **A1**

Answer: x = (8 - 3y)/(-1)

Question 11

1/n = 1/c - 4/m **M1**

combines into a single fraction **M1**

inverts both sides **M1**

n = cm/(m - 4c) oe **A1**

Answer: n = cm/(m - 4c)

Question 12

divides by 4 **M1**

squares both sides **M1**

$x = (y/4)^2 + 1$ oe **A1**

Answer: $x = (y/4)^2 + 1$

Question 13

$y + 2 = (x - 4)^2$ **M1**

square roots **M1**

$x = \sqrt{y + 2}$ + 4 oe **A1**

Answer: $x = \sqrt{y + 2}$ + 4

Question 14

expands the bracket **M1**

collects x terms on one side **M1**

x = (8 - 4y)/(-2) oe **A1**

Answer: x = (8 - 4y)/(-2)

Question 15

multiply both sides by (x - 1) and expand to get $p(x - 1) = x^2 + 2x$ **M1**

rearrange to quadratic form $x^2 + (2 - p)x + p = 0$ **M1**

apply the quadratic formula with a = 1, b = (2 - p), c = p **M1**

$x = [\ -(2 - p) \pm \sqrt{(2 - p)^2 - 4p}\ ]/2$ cao **A1**

Answer: $x = [\ -(2 - p) \pm \sqrt{(2 - p)^2 - 4p}\ ]/2$

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