2.12 Writing and Using Formulae: 1-hour Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Use the formula A = 1/2 bh
to work out the value of A when b = 9, h = 6.

(2)

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2 The cost, C pounds, of hiring a ladder for h days is given by C = 38 + 7h.
Work out the cost of hiring the ladder for 12 days.

(2)

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3 The cost, C pounds, of hiring a ladder for h days is given by C = 40 + 6h.
Work out the cost of hiring the ladder for 4 days.

(2)

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4 Use the formula v = u + at
to work out the value of v when u = 2, a = 4, t = 8.

(2)

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5 Use the formula v = u + at
to work out the value of v when u = 9, a = 2, t = 4.

(2)

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6 A car travels at a constant speed. Distance d in kilometres is given by d = 50t, where t is time in hours.

(a) How far does the car travel in 1.5 hours? Give your answer in km. **(2)**

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(b) How long does it take to travel 125 km? Give your answer in hours. **(1)**

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7 The cost, C pounds, of hiring a ladder for h days is given by C = 48 + 7h.
Work out the cost of hiring the ladder for 12 days.

(2)

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8 The cost, C pounds, of hiring a ladder for h days is given by C = 25 + 9h.
Work out the cost of hiring the ladder for 6 days.

(2)

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9 Make t the subject of the formula v = u + 3t.

(3)

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10 The cost, C pounds, of hiring a ladder for h days is given by C = 34 + 7h.
Work out the cost of hiring the ladder for 3 days.

(2)

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11 The cost, C pounds, of hiring a ladder for h days is given by C = 34 + 5h.
The total cost is £59. Work out the number of days.

(3)

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12 Use the formula A = 1/2 bh
to work out the value of A when b = 7, h = 3.

(2)

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13 The cost, C pounds, of hiring a ladder for h days is given by C = 27 + 6h.
Work out the cost of hiring the ladder for 13 days.

(2)

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14 Use the formula P = 2(l + w)
to work out the value of P when l = 8, w = 5.

(2)

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15 Use formulae with units. The formula for average speed v in m/s is v = s / t, where s is distance in metres and t is time in seconds.

(a) A runner covers 400 m in 50 s. Find the average speed in m/s. Give your answer as a decimal to two decimal places. **(2)**

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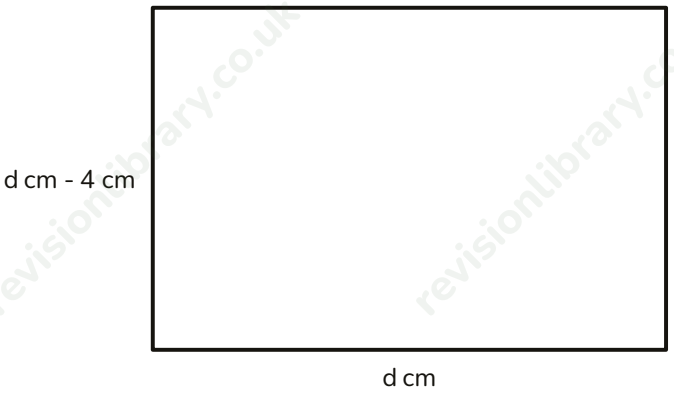
(b) A skateboarder travels at 2 m/s for 45 s. Find the distance covered in metres. **(2)**

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16 A rectangle has length d cm and its width is 4 cm shorter than its length. Write a formula for the perimeter, P cm.

Diagram NOT accurately drawn



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(2)

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17 Write a formula from a worded rule. Each question uses the same letter for the unknown.

(a) Multiply a number n by 6, then subtract 4. Call the result R. **(1)**

(b) Add 9 to a number p, then divide the result by 3. Call the result S. **(1)**

(c) Double a number x, then square the result. Call the result T. **(1)**

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18 Rearrange to make x the subject. Start from $4x + 9 = y$.

(a) Rearrange $4x + 9 = y$ to make x the subject. **(3)**

(b) Use your formula to find x when $y = 17$. **(1)**

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19 The formula $A = 4x + 9$ is used. Given $A = 25$, find x.

(1)

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20 Using $l = 2V / (bh)$, find l when $V = 60$, $b = 5$ and $h = 4$.

(2)

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Mark scheme · 2.12 Writing and Using Formulae: 1-hour Pack

Question 1

correct substitution into the formula	M1
27 cao	A1

Answer: **27**

Question 2

substitutes h = 12: 38 + 7 x 12	M1
£122 cao	A1

Answer: **£122**

Question 3

substitutes h = 4: 40 + 6 x 4	M1
£64 cao	A1

Answer: **£64**

Question 4

correct substitution into the formula	M1
34 cao	A1

Answer: **34**

Question 5

correct substitution into the formula	M1
17 cao	A1

Answer: **17**

Question 6

(a) substitution d = 50 x 1.5 or equivalent method	M1
(a) 75 km cao	A1

(a) Answer: **75 km**

(b) 2.5 hours cao	B1

(b) Answer: **2.5 hours**

Question 7

substitutes h = 12: 48 + 7 x 12	M1
£132 cao	A1

Answer: **£132**

Question 8

substitutes h = 6: 25 + 9 x 6	M1
£79 cao	A1

Answer: **£79**

Question 9

correct first step (e.g. undo the addition or subtraction)	M1
correct second step (divide by the coefficient)	M1
(v - u)/3 oe cao	A1

Answer: **t = (v - u)/3**

Question 10

substitutes h = 3: 34 + 7 x 3	M1
£55 cao	A1

Answer: **£55**

Question 11

34 + 5h = 59	M1
5h = 25 or equivalent	M1
5 (days) cao	A1

Answer: **5 days**

Question 12

correct substitution into the formula	M1
10.5 cao	A1

Answer: **10.5**

Question 13

substitutes h = 13: 27 + 6 x 13	M1
£105 cao	A1

Answer: **£105**

Question 14

correct substitution into the formula	M1
26 cao	A1

Answer: **26**

Question 15

(a) substitution v = 400/50 or equivalent	M1
(a) 8.00 m/s cao	A1

(a) Answer: **8.00 m/s**

(b) substitution s = v x t or equivalent	M1
(b) 90 m cao	A1

(b) Answer: **90 m**

Question 16

one correct term or a correct structure	M1
P = 4d - 8 oe cao	A1

Answer: **P = 4d - 8**

Question 17

(a) R = 6n - 4 cao	B1

(a) Answer: **R = 6n - 4**

(b) S = (p + 9) / 3 or S = (p+9)/3 cao	B1

(b) Answer: **S = (p + 9) / 3**

(c) $T = (2x)^2$ or $T = 4x^2$ cao	B1

(c) Answer: **$T = (2x)^2$**

Question 18

(a) subtract 9 from both sides or show 4x = y - 9	M1
(a) divide both sides by 4 or show x = (y - 9) / 4	M1
(a) x = (y - 9) / 4 cao	A1

(a) Answer: **x = (y - 9) / 4**

(b) x = 2.0 or 2 cao	B1

(b) Answer: **2**

Question 19

x = 4 cao	B1

Answer: **4**

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Question 20

substitutes V = 60, b = 5, h = 4	**M1**
6 cao	**A1**

Answer: **6**

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