

UK Answers

Orange



Challenge Cards

1. Use the alphabet to break the sequences:
 - a. m , 16 [add 3]
 - b. 19 , 25 [add 6]
 - c. k , f [subtract 5]
 - d. 14, 13, 17 [+4, +2, -1, repeat]
 - e. q , u , y [add 4 letters]
 - f. 15, 12 1/2, 9 1/2
[-1/2 ,1, 1 1/2]

2. Alessandra 13
Antonio 11

3. Fumiko wakes → 7:11am
Dressed → 7:15am
Brush hair → 7:26am
Eat & teeth → 7:35am
Dog walk → 7:47am
Pack bag → 7:50am

- 4 a. $3 + 7 = 10$ $3 \times 7 = 21$
b. $7 + 6 = 13$ $7 - 6 = 1$
c. $10 \times 2 = 20$ $10 - 2 = 8$
d. $7 \times 4 = 28$ $7 + 4 = 11$
e. $8 \times 3 - 7 = 17$

5. 2
 1 3 5
 4
Sum is 9 in both directions

- 6a. $2 + 3 + 4 = 9$
b. $4 \times 5 \div 2 = 10$
c. $5 \times 3 - 2 = 13$
d. $3 \times 5 + 4 = 19$
d. $5 + 2 - 3 = 4$

<u>Week</u>	<u>Dogs</u>	<u>Earnings</u>
1	4	12
2	6	18
3	8	24
4	10	30
5	12	36
6	14	42
7	16	48

Total = 70 dogs for £210

8. “How many people must play in a game of netball?”
Answer = 14
9. 30 stickers ÷ 5 = 6 each
6 is median ⇒ middle brother
Eldest to youngest receive
 $10 + 8 + 6 + 4 + 2 = 30$
10. Arithmetic reasoning
 $\Theta + \Theta = \Psi = \Theta \times \Theta$
 Therefore $2 + 2 = 2 \times 2 = 4$
 $\Theta = 2$ ☎ = 8
 $\Psi = 4$ 🕸 = 3
 $\Delta = 6$ ★ = 12
11. Nikita R3 ÷ 10 = 30¢ frog
Tanita R3 ÷ 20 = 15¢ rasp.
12. Squares (17) Rectangles (34)
 13 x 1's 15 x 2's
 4 x 4's 8 x 3's
 4 x 4's
 2 x 5's
 4 x 6's
 1 x 8's
 Total 51 shapes

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- 13a. $(5 + 7) \div 4 = 3$
 b. $4 + 7 - 6 = 5$
 or $4 + 6 - 5 = 5$
 c. $6 \times 5 - 7 = 23$
 d. $7 \times 5 + 4 = 39$
 d. $20 \div 4 + 7 = 12$
14. $31 - 10 = 21$ minutes skating
 $21 \div 3 = 7$ min per mile
 4 miles at 7 min per mile
 = 28 minutes to Kristy's
15. Work backwards
 Martin 5 tries
 Jonny 4 tries
 Will 18 tries
 Josh 30 tries
 Total 57 tries
16. $16 \text{ prints} \div 4 = 4$ cats
 $16 \text{ tails} - 4 \text{ cats} \Rightarrow 12$ fish
17. Process of elimination
 Mystery number is 123
- 18a. $3/4$ ate sandwiches on Thurs.
 b. $24 \text{ rolls} - 16 \text{ pastries} = 8$ more
 b. $60 \text{ out of } 100 = 3/5$ of children
19. "Guess & revise" or algebra
 $141 \text{ cards} \div 3 = 47$ cards
 Diego 94 $[47 \times 2 = 94]$
 Pablo 47
20. 40 icecreams in 10 segments
 Each segment $\Rightarrow 4$ icecreams
 Chocolate = $2 \frac{1}{2} \times 4 = 10$
 Vanilla = $1 \frac{1}{2} \times 4 = 6$
 Blueberry = $3 \frac{1}{2} \times 4 = 14$
 Strawberry = $2 \frac{1}{2} \times 4 = 10$

21. Use/draw a calendar
 Sunday 1st
 Friday 13th

22.

2	7	6
9	5	1
4	3	8

All lines add to 15

23. $\pounds 4 \div 80\text{p} = 5$ tennis balls
 $\pounds 4 \div 50\text{p} = 8$ golf balls
24. Three years ago
 Sigmund 6 & Id 3
 Sigmund is 12 years old
 Id is 6 years old
25. Isaac – magazine
 Clea – *Harry Potter*
 Abigail – *Just Tricking*
 Elias – *The Lost World*
26. Etienne
 $60 \div 3 = 20$ per hour
 Elodie
 $60 \div 5 = 12$ per hour
 \Rightarrow Etienne sucks 8 more
 gobstoppers per hour
27. Arithmetic elimination
 $\aleph = \Phi\Phi\Phi$
 $\Theta\Theta = \Phi\Phi\Phi\Phi\Phi\Phi\Phi\Phi$
 Therefore
 $\Theta = \Phi\Phi\Phi\Phi$
 $\Theta\Theta\Theta = \aleph\aleph\aleph\aleph$

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28. Process of elimination
Mystery number is 9853

29.

18	11	16
13	15	17
14	19	12

All lines add to 45

30. June has 30 days \Rightarrow 6 rotations
Vikram consumes in total
12 tins, 6 bones, 600 biscuits

31a. $6 \div 3 \times 4 = 8$

b. $6 \times 5 \div 3 = 10$

c. $4 \times 3 - 5 = 7$

d. $5 \times (6 + 3) = 45$

e. $36 \div 6 + 5 = 11$

32. 52×2 calls = 104 calls
Maria 69 or 70 calls
Mario 35 or 34 calls
Depending on who called first

33. 238 is the answer
Even, 3 'tens', 7 is a factor

34. Distances Morgan measured
50, 45, 40, 35, 30,
25, 20, 15, 10, 5
Pair them $(0 + 55) = 55$, etc.
 $5 \times 55\text{m (pairs)} =$
275 metres in total

35.

6	7	8	9
2	4	6	8
5	8	11	14
6	10	14	18

36. $1 + 2 + 3 + 4 + 5 + 6$
 $+ 7 + 8 + 9 + 10$
 $= 55$

Clarissa is 10 years old

37a. 20, 21 [+5, +4, +3...]

b. 17, 33 [$\times 2$, $- 1$] repeat

c. 8, 2 [2^{nd} number = $1^{\text{st}} \div 4$
 3^{rd} no. = $1^{\text{st}} - 4$] repeat

d. 6, 8 1/2 [$+1/2$, $+1$, $+1 1/2$, ...]

e. 72, 89 [$+13$, 14 15 ...]

38. 83 hours $-$ 11 hours rest
 $= 72$ hours scurrying
 $72 \times 12\text{m per hour} =$
864 metres

39. $2002 - 1942 = 60$ years
 $60 \div 5 = 12$ years
 $2002 - 12 = 1990$
Roslyn was born

40. Use/create a number chart
Answers 11, 13, 16, 18, 23

41. $23 \times 12 = 276$ minutes
of riding time
 $= 4$ hours + 36 minutes
Finish time $\Rightarrow 2:36\text{pm}$

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42. Pattern +2, +4, +6, +8, ...
 $\Rightarrow 42 + 14 = 56$

43. "Guess & revise" or algebra
 $x =$ Cassie's biscuits
 $4x + 2x + x = 84$
 $\Rightarrow 7x = 84, x = 12$
 Zoe ($4x$) 48
 Ben ($2x$) 24
 Cassie (x) 12

44. Playing with the division key
 $1 \div 2 = 1/2 = 0.5$
 $2 \div 3 = 2/3 = 0.666$
 $3 \div 4 = 3/4 = 0.75$
 $4 \div 5 = 4/5 = 0.8$
 $5 \div 6 = 5/6 = 0.833$
 $6 \div 7 = 6/7 = 0.857$

45. 15
 16 17 18
 19
 Sum is 51 in both directions

46. $60 \div 5 = 12$ cards each
 12 is median = middle sister
 Eldest to youngest receive
 $20 + 16 + 12 + 8 + 4 =$
 60 swap cards

47.

+	3	5	6
4	7	9	10
1	4	6	7
6	9	11	12
2	5	7	8

48. "How many seconds does it take light to travel from the sun to earth?"
 Approximately 8 seconds

49. ♠ = 6 or 8 ♦ = 9
 ☺ = 8 or 6 ■ = 2
 → = 3 ✎ = 7
 👉 = 6 [an accidental double]

50. Macauley runs
 There 3miles $\times 2 = 6$ miles
 Back 3miles + 1m = 4miles
Answer 10 miles in total

51. "Guess & revise" or algebra
 Abdul is 'x' years
 $2x + x + (x - 2) = 26$
 $\Rightarrow 4x - 2 = 26,$
 $\Rightarrow 4x = 28, \text{ so } x = 7$
 Inzaman is 14 years old
 Abdul is 7 years old
 Azim is 5 years old

52. Process of elimination
 37 or 19

53. Arithmetic reasoning
 $36 \div 3 = 12$
 $36 \div 5 = 7$ with 1 remainder
 $36 \div 4 = 9$
Answer 36 swap cards

54. Work in reverse
 a. $(13 - 4) \div 3 = 3$
 b. $(36 \div 9) + 6 = 10$
 c. $(15 + 5) \times 2 = 40$
 d. $(4 \frac{1}{2} \times 2) + 8 = 17$



55. "Guess & revise" or algebra
 Bathers cost 'x' pounds
 $x + (x - 5) + (x + 10) = 50$
 $\Rightarrow 3x + 5 = 50$
 $\Rightarrow 3x = 45$, so $x = 15$
 Bathers £15
 Hat £10
 Top £25

56. "Guess & revise" or algebra
 Marco has 'x' stamps
 $x + (x + 150) = 1300$
 $\Rightarrow 2x + 150 = 1300$
 $\Rightarrow 2x = 1150$, so $x = 575$
 Marco has 575 stamps
 Tobias has $575 + 150 = 725$

57.

2	6	X	1
X	0	4	7
2	X	3	2
6	4	3	X

58. "Guess & revise" or algebra
 Twins are 'x' years
 $2x + (x + 9) = 30$
 $\Rightarrow 3x + 9 = 30$
 $\Rightarrow 3x = 21$, so $x = 7$
 Twins are 7 years old
 Libby is 16 years old

59. ♯ = 4 or 9 ◆ = 8
 ☉ = 9 or 4 ■ = 6
 🐕 = 5 🌲 = 2
 □ = 7

60. "Guess & revise" or algebra
 Siobhan has 'x' marbles
 $x + (x - 4) + (x - 8) = 30$
 $\Rightarrow 3x - 12 = 30$
 $\Rightarrow 3x = 42$, so $x = 14$
 Siobhan 14 marbles
 Briana 10 marbles
 Tamsyn 6 marbles

61a. 24 students
 b. 6 out of 24 = 1/4
 c. Adventure tales
 8 out of 24 = 1/3

62. Multiplication table
 1st row 9 not needed
 2nd row 4 not needed
 3rd row 5 not needed
 4th row 2 not needed

63. "Guess & revise" or algebra
 Book costs 'x' pounds
 $(x + 6) + x + (x - 7) = 50$
 $\Rightarrow 3x - 1 = 50$, so $x = 17$
 Cd £23
 Book £17
 Cards £10

64. Jin £4 ÷ 8 =
 50p per python
 Tao £4 ÷ 20 =
 20p per lolly lizard

65. 30 min – 5 min – 1 min =
 24 minutes riding
 $24 \div 4 = 6$ minutes per mile
 Therefore, to ride to Andy's
 $7 \frac{1}{2} \times 6 = 45$ minutes

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66. "People who believe in themselves and always try their best have a positive what?"

$$1+20+20+9+20+21+4+5 = 100$$

Answer is "Attitude"

67. Work in reverse

Emma 10
 Daisy $10 \times 2 = 20$
 Dean $20 + 5 = 25$
 Tom $25 + 6 = 31$
 Lucy $31 + 3 = 34$
 Total = 120

Each chain
 $= 120 \div 5 \Rightarrow 24$ daisies

68. Triangles (16) Squares (14)
 12 small 9 x 1's
 4 large 4 x 4's
 1 x 9's

Answer 30 shapes

- 69a. $5 \times 6 + 9 = 39$
 b. $8 \times 5 - 7 = 33$
 or $6 \times 7 - 9 = 33$
 c. $9 + 8 - 6 = 11$
 d. $7 + 5 + 9 = 21$
 or $6 + 7 + 8 = 21$
 e. $35 \div 7 + 9 = 14$

70. Stuart wakes at 5:18am
 Dress & pack \rightarrow 5:26am
 Breakfast \rightarrow 5:37am
 Bathroom \rightarrow 5:43am
 Driving \rightarrow 6:00am
 Swimming \rightarrow 7:30am
 Changing \rightarrow 7:42am
 Eating \rightarrow 7:51am
 Walking takes 9 minutes
 8am arrives at school

- 71a. N, S [alphabet +5 -2]
 b. 20, 18 [+4 -2]
 c. K, P [+1 +2 +3 +4...]
 d. 14, Q [+3 mix]
 e. j, i [alphabet +3 -1]

72. Days	Daily cars	Total cars
1,2,3	2	6
4,5,6	3	9
7,8,9	4	12
10,11,12	5	15
13,14	6	12

Therefore Vasily washes
 58 cars at £3 each
 $54 \times £3 = £162$

73. "Guess & revise" or algebra
 Chin is 'x' years
 $(x - 3) + x + (x + 4) = 22$
 $3x + 1 = 22$, so $x = 7$
 Chin 7 years
 Ho 4 years
 Sun 11 years

- 74a. $5 + 5 = 10$ $5 \times 5 = 25$
 b. $9 \times 4 = 36$ $9 - 4 = 5$
 c. $19 - 7 = 12$ $19 + 7 = 26$
 d. $4 + 8 = 12$ $4 \times 8 = 32$
 e. $8 - 5 = 3$ $8 \times 5 = 40$



75. "Guess & revise" or algebra

Adult tickets

$$2y \Rightarrow 2 \times 2y = 4y$$

Child tickets

$$y \Rightarrow 3 \times y = 3y$$

Total tickets

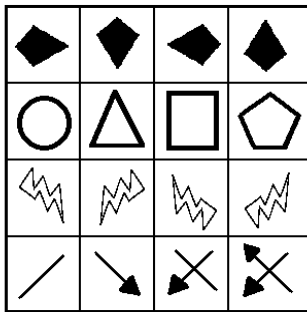
$$7y = \text{£}42$$

Answer

$$\text{£}42 \div 7 = \text{£}6 \text{ per child ticket}$$

Adult tickets cost £12

76.



77. Arithmetic reasoning

$$\psi = 2 \quad \prod = 3$$

$$\infty = 6 \quad \sum = 7$$

$$\notin = 9$$

78.

-	28	14	18
7	21	7	11
9	19	5	9
3	25	11	15

79. Doubling pattern for 10 weeks

$$5\text{¢} + 10\text{¢} + 20\text{¢} + 40\text{¢} +$$

$$80\text{¢} + \$1.60 + \$3.20 +$$

$$\$6.40 + \$12.80 + \$25.60$$

$$= \$51.15$$

Previously $\$3.50 \times 10 = \35

80. 1 set of 3 laps takes 8 minutes

$$\Rightarrow 120 \div 8 = 15 \text{ sets}$$

$$15 \times 3 \text{ laps} =$$

45 laps in total



E81. Arithmetic reasoning

$$\prod = 3$$

$$\notin = 4$$

$$\leftrightarrow = 5$$

$$\Omega = 6$$

E82. "Guess & revise" or algebra

Elizabeth sells 'x' tulips

$$2x + x + (2x - 11) + 1 = 100$$

$$\Rightarrow 5x - 10 = 100$$

$$\Rightarrow 5x = 100, \text{ so } x = 22$$

Tulips = 22
Roses = 44
Irises = 33
[kept 1 'flower' for herself]

E83. £3.60 ÷ 60p =
6 nectarines
18 - 6 = 12
£9.60 ÷ 12 =
80p for a peach

E84. "Guess & revise" or
Set-up a table

Answer

3 cats
12 sparrows
8 pigeons
4 blackbirds

$$(3 \times 4) + (24 \times 2) = 12 + 48 \Rightarrow$$

60 legs & 27 heads

E85. 1st Set-up a table

<u>Day</u>	<u>Dogs</u>	<u>Cats</u>
1	1	2
2	2	4
3	3	6
4	4	8
5	5	10
6	6	12
7	7	14
<u>Total</u>	<u>28</u>	<u>56</u>

2nd "Guess & revise" or algebra

Costs

Let y = £ cat, so dog $\Rightarrow 3y$
Dogs 28 x 3y = 84y
Cats 56 x y = 56y

Therefore

$$84y + 56y = 140y$$

$$140y = £280, \text{ so } y = £2$$

Answer

Washing prices \Rightarrow
Cat £2 & Dog £6

E86. 1st half

5 miles @ 10mph \Rightarrow 30min

2nd half

30min x 2 = 60min

Total

30 + 60 + 5 [break] \Rightarrow 95min

87. Arithmetic reasoning

$$\Psi = 3$$

$$\phi = 4$$

$$\emptyset = 5$$

$$\leftrightarrow = 6$$

$$\Sigma = 7$$

$$\# = 8$$



E88. "Guess & revise" or algebra

A child's ticket cost x pounds

$$3x + 2(x + 5) = \text{£}70$$

$$\Rightarrow 5x + 10 = 70$$

$$\Rightarrow 5x = 60, \text{ so } x = 12$$

Answer

Child ticket £12

Adult ticket £17

89. Set-up an answer table
[30 questions \rightarrow 48 points]

<u>Correct</u>	<u>Incorrect</u>	<u>Points</u>
30	0	60
29	1	57
28	2	54
27	3	51
26	4	48

Answer

26 correct answers

E90. Work in reverse

$$\text{Split} = 1 - 1/2 - 1/4 = 1/4$$

Family receive $1/4$

$$(5 \times 4) \times 6 = 120$$

$$120 + 5 \text{ [dog]} = 125 \text{ in total}$$

$$\text{Friends} = 125 \times 2 = 250$$

$$\text{Jack kept } 1/4 \text{ for himself} = 125$$

$$\text{Total} = 125 + 250 + 125$$

$$\Rightarrow 500 \text{ jelly beans}$$

Extensions 91 \rightarrow 100

These are open-ended questions,
with no set solutions.

Please refer to introductory Sheet 3
for a thorough explanation.