1) 8 college teams participate in a marathon. 4 of the teams each have 28 students, 3 of the teams each have 30 students and 1 team has 40 students.
How many students in total participate in the marathon?

A  212
B  202
C  242
D  312
E  186

2) Wendy runs errands for her mother. She cycles 1.2 kilometres to the bank, 3 kilometres to the library and 0.7 kilometres to the church.
How far does she cycle in total?
*Give your answer to the nearest whole kilometre.*

A  3 km
B  7 km
C  9 km
D  4 km
E  5 km

3) Each column in the table below is supposed to show a number followed by two of its factors in brackets.
Which column contains an error?

| Column W | Column G | Column X | Column S | Column V |
|---|---|---|---|---|
| 366 (61  3) | 786 (3  131) | 511 (7  9) | 650 (13  130) | 420 (14  60) |

A  Column W
B  Column G
C  Column X
D  Column S
E  Column V

4) What is a quarter of $(1.348 \div 10^3)$?

**A** 3.37
**B** 0.337
**C** 0.32
**D** 0.0337
**E** 33.7

5) Paul wants to store his holiday photos in albums. Each side of a page in an album can hold 8 photos and each album has 10 pages, each with 2 sides.
How many albums does Paul need to organise 400 photos?

**A** 3
**B** 5
**C** 4
**D** 2
**E** 7

6) What is the length of Line A to the nearest metre?



Line A
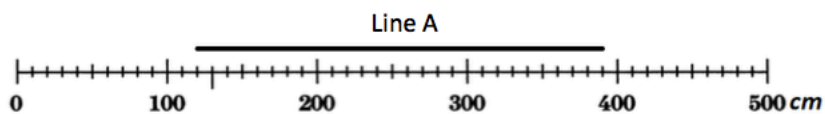
**A** 2 m
**B** 3 m
**C** 30 m
**D** 190 m
**E** 270 m

7) The total time spent in descent on an 8-hour flight from London to Nairobi is 30 minutes. What fraction of the total flight time is spent in descent?

**A** 1/8
**B** 1/2
**C** 1/50
**D** 1/32
**E** 1/16

8) The total weight of 15 identical cans is 3 kg, rounded to the nearest kg. Which of the following could be a possible weight of each can?

**A** 300 g
**B** 250 g
**C** 150 g
**D** 175 g
**E** 500 g

9) Rowan walks 7$a$ km on each weekday and 4$b$ km each day during the weekend. Which of the following expressions shows the distance Rowan walks in 1 week?

**A** (35$a$ + 8$b$) km
**B** (7$a$ + 8$b$) km
**C** (35$a$ + 4$b$) km
**D** (7$a$ + 4$b$) km
**E** (35$a$ + $b$) km

10) Figure A is a cube that is formed from identical smaller cubes. Figure A has a volume of 729 cm³. A string is wound tightly all around 4 faces of Figure A. Part of the string is shown by the bold line on the diagram below.
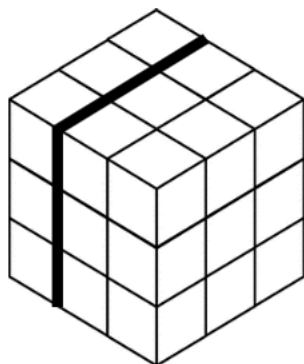What is the total length of the string?



Figure A

A   27 cm
B   36 cm
C   16 cm
D   12 cm
E   8 cm


11) Sue thinks of a number. She multiplies it by 9, subtracts 15 and then doubles the result.
Her answer is 600.
What number did Sue think of?

A   19
B   36
C   35
D   42
E   39


12) What is the mean of all the prime numbers between 10 and 20?

A   12
B   15
C   11
D   13
E   18

**13)** In the diagram below, the diameter of the circle is the same as the side length of the square.
What is the radius of the circle?
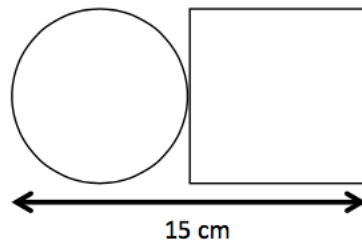


15 cm

**A** 3.2 cm
**B** 3.6 cm
**C** 1.5 cm
**D** 1.25 cm
**E** 3.75 cm

**14)** ⅝ of the students at Top School own a bicycle. If 165 students at Top School don't own a bicycle, how many students are there at Top School in total?

**A** 420
**B** 350
**C** 440
**D** 630
**E** 508

**15)** What is the probability that a day of the week, chosen at random, does not have a vowel as its second letter?

**A** 2/7
**B** 1/7
**C** 5/7
**D** 3/7
**E** 4/7

16) Which number is halfway between 4.1 and 5.5?
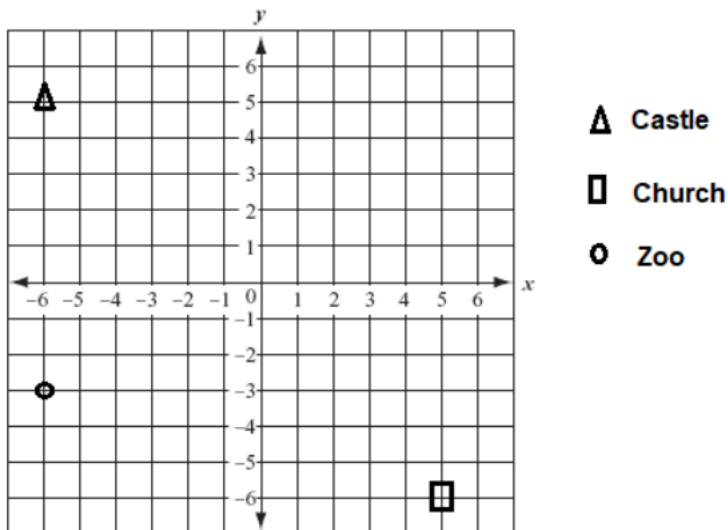
A  4.3
B  4.4
C  4.8
D  5.25
E  5.3


17) Which of the following numbers does not belong with the others?

   81  121  125  400  36

A  169
B  400
C  125
D  36
E  121


18) What are the co-ordinates of the castle?



A  Castle

□  Church

O  Zoo

A  (6 , 5)
B  (-6 , 5)
C  (6 , -5)
D  (-5 , -6)
E  (-6 , -5)

19) Which of these words contains vowels and non-vowels in the ratio 1:2?

**A** PASSING
**B** ANSWER
**C** WRONG
**D** WEEKEND
**E** STUNNING

20) What is 320 ÷ 600 as a fraction in its simplest terms?

**A** 8/15
**B** 4/15
**C** 4/9
**D** 5/12
**E** 7/15

21) In a test, 9 marks are awarded for every correct answer, 2 marks are deducted for every wrong answer and 5 marks are deducted for skipping a question without answering it. Sam took the test. The table below shows how many questions Sam got correct, how many questions he got wrong and how many questions he skipped.
What was Sam's total score on the test?

| Correct | 12 |
|---------|----|
| Wrong   | 6  |
| Skipped | 3  |

**A** 75
**B** 81
**C** 90
**D** 88
**E** 108

**22)** The figure below is a square formed from 2 identical triangles and 2 identical smaller squares. The side length of each smaller square is 5 cm.
What is the area of the shaded triangle?
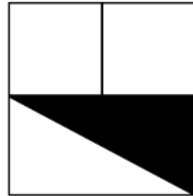


A   25 cm$^2$
B   20 cm$^2$
C   50 cm$^2$
D   100 cm$^2$
E   125 cm$^2$

**23)** Sonia can walk 4.4 km in 1 hour.
How far can Sonia walk in 4.5 hours.
Round your answer to the nearest km.

A   15 km
B   18 km
C   19 km
D   20 km
E   17 km

**24)** Tom bought 5 dozen apples. ⅖ of them were green apples and the rest were red apples.
How many red apples did Tom buy?

A   24
B   60
C   36
D   26
E   16

25) Figure B shows part of a cupcake recipe.

How much flour is needed to make 45 cupcakes?

**Cupcakes**
*(makes 20)*

.......

**Plain flour**   300 g

......

Figure B

**A**  600 g
**B**  425 g
**C**  750 g
**D**  675 g
**E**  700 g

26) $2c = 6b - 2a$

If $a = 4$ and $b = 2$, what is the value of $c$?

**A**  2
**B**  6
**C**  3
**D**  4
**E**  1

27) Mel has half as many sweets as George.

If Mel has $4y$ sweets, how many do they have altogether?

**A**  $8y$
**B**  $6y$
**C**  $2y$
**D**  $12y$
**E**  $16y$

28) The table below shows the weights of different animals.

| Animal | Weight |
|--------|--------|
| Beaver | 6.87 kg |
| Dog | 8.44 kg |
| Kitten | 5.54 kg |
| Bat | 5.1 kg |
| Rabbit | 7.3 kg |

When the weight of each animal is rounded to the nearest kg, which 2 animals weigh the same?

**A** Beaver and Rabbit

**B** Dog and Bat

**C** Beaver and Kitten

**D** Kitten and Rabbit

**E** Bat and Beaver
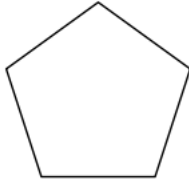
29) It takes 9 people 4 hours to dig a pit. How long would it take 12 people to dig the same same pit?

**A** 3 hours

**B** 6 hours

**C** 4.5 hours

**D** 12 hours

**E** 6.5 hours

30) What is 16.5/30 as a percentage?

**A** 55%

**B** 65%

**C** 44%

**D** 12%

**E** 60%

31) The shape below is a regular pentagon with a side length of *3y* cm.



Which of the following expressions shows the perimeter of this shape?

**A**  120*y* mm
**B**  6*y* cm
**C**  4*y* cm
**D**  15*y* m
**E**  150*y* mm


32) What is the mode of the following numbers?

11  9  14  11  12  14  11  15

**A**  12
**B**  11
**C**  9
**D**  14
**E**  15


33) Which of these calculations is correct?

**A**  7 × 8 + 3 = 77
**B**  6 × 11 - 2 = 54
**C**  81 + 9 ÷ 3 = 30
**D**  5 - 7 × 9 = -58
**E**  14 × 10 + 10 = 280

**34)** Which of the following numbers is closest to 15?

**A** 15.01
**B** 15.001
**C** 14.9
**D** 14.91
**E** 14.09

**35)** Reena and Victor share £15.40 in prize money in the ratio 2:5.
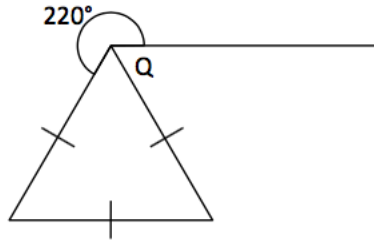How much money does Victor receive?

**A** £11
**B** £3.10
**C** £4.40
**D** £4.04
**E** £4.10

**36)** The diagram below shows a garden. 30% of the garden's surface area is covered by
2 star-shaped blocks of paving. The rest of the garden is covered in grass and gravel.
What surface area of the garden is covered in paving?



18 m

30 m
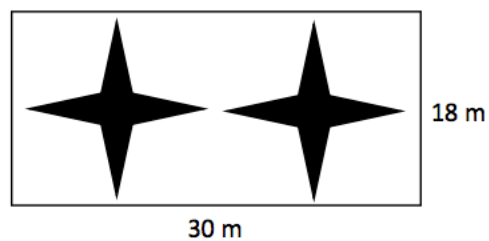
**A** 162 cm$^2$
**B** 540 cm$^2$
**C** 440 cm$^2$
**D** 120 cm$^2$
**E** 210 cm$^2$

37) What is the size of Angle Q?



220°

Q

NOT DRAWN TO SCALE

**A** 50°
**B** 100°
**C** 80°
**D** 70°
**E** 90°

38) Susan, Emily, Lizzie, Irene and Dorothy each write their name on a separate piece of paper and drop them into a hat. One piece of paper is then picked at random.
What is the probability that the name on this piece of paper contains more than 5 letters?

**A** 0.4
**B** 0.1
**C** 0.12
**D** 0.5
**E** 0.25

39) A rectangle has a length that is twice its width. If the width of the rectangle is 2.5 cm, what is the area of the rectangle?

**A** 125 cm$^2$
**B** 1.25 cm$^2$
**C** 12.5 mm$^2$
**D** 12.5 cm$^2$
**E** 125 mm$^2$

**40)** To make 1 glass of juice. Megan mixes 20 cm³ of squash with 250 ml of water.
How many glasses of juice can she make from the bottle of squash below?
1 litre = 1,000 cm³



2.5 L

**A** 120
**B** 125
**C** 1,250
**D** 15
**E** 100

**41)** The 3D figure below has been made by combining a cube and a triangular prism.
How many faces does the figure have?



**A** 12
**B** 5
**C** 10
**D** 9
**E** 7

42) The radius of Circle A is 6.28 times smaller than its circumference.
If the diameter of Circle A is 5.6 km, what is its circumference?

A  35,168 m
B  891 m
C  16,748 m
D  10,000 m
E  17,584 m

43) Which of the following is the largest?

A  0.35
B  32.50%
C  9/25
D  0.048
E  7/20

44) How many more vertices does a cube have than a square-based pyramid?

A  3
B  1
C  4
D  5
E  6

45) ⅗ of the birds in a garden are robins, 12% are sparrows and the rest are wrens.
What percentage of the birds in the garden are wrens?

A  21%
B  22%
C  18%
D  28%
E  72%

46) William visits the park every 4 days whilst Katie visits the park every 10 days.
If they both visited the park today, after how many days will they both visit the park again on the same day?

**A** 40
**B** 9
**C** 20
**D** 15
**E** 6

47) The length and width of Rectangle A are 10 cm and 6 cm respectively.
The area of Rectangle B is ⅖ of the area of Rectangle A.
Which of the following could be the length and width of Rectangle B?

**A** 3 cm, 5 cm
**B** 18 cm, 2 cm
**C** 4 cm, 5 cm
**D** 5 cm, 8 cm
**E** 12 cm, 2 cm

48) After a 10% discount, a television is sold for £270.
What was the original price of the television?

**A** £3,000
**B** £290
**C** £360
**D** £300
**E** £600

49) What is the largest number that can divide exactly into both 128 and 48?

**A** 16
**B** 24
**C** 8
**D** 32
**E** 4

50) 3 bells ring after intervals of 8, 12 and 20 minutes respectively. The 3 bells ring together at 06:08.
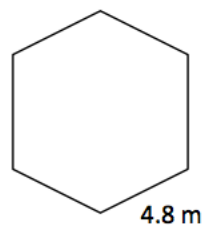At what time will the 3 bells next ring together?

A  20:08
B  06:48
C  09:07
D  08:08
E  07:12

51) Which fraction is equivalent to $(6.25 \div 125)$?

A  1/25
B  2/15
C  8/15
D  1/32
E  1/20

52) Mary builds a fence around one quarter of the perimeter of the regular hexagonal field below.
If the fence requires 8 poles for every 80 cm length of fence, how many poles does she use in total?



4.8 m

A  72
B  20
C  18
D  27
E  40

53) $0.6y = 3/25$

What is the value of $y$?

A  1/4
B  1/3
C  1/5
D  1/10
E  2/5
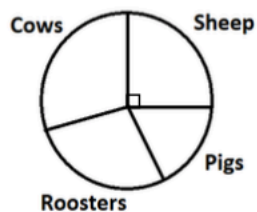
54) Harry has 3 times more marbles than Fred. Together they have 328 marbles.
How many marbles does Harry have?

A  82
B  68
C  246
D  180
E  174

55) The pie-chart below shows the different types of animals in a farm.
If there are 52 sheep in the farm, how many animals are there in total in the farm?



Cows    Sheep

Pigs

Roosters

A  200
B  186
C  208
D  206
E  192

56) Suzie's dartboard has a diameter of 30 cm. The radius of Ben's dartboard is 60% bigger than the radius of Suzie's dartboard.
What is the diameter of Ben's dartboard?

**A** 48 cm
**B** 50 cm
**C** 24 cm
**D** 60 cm
**E** 52 cm

57) Triangle A is equilateral and has a side length of 15 cm. The diameter of Circle A is 60% of the perimeter of Triangle A.
What is the radius of Circle A?

**A** 45 cm
**B** 28 cm
**C** 27 cm
**D** 13.5 cm
**E** 18 cm

58) The normal price for a remote-controlled car is £75.
Beth uses a 15% discount voucher to buy the remote-controlled car.
How much does Beth pay for the remote-controlled car?

**A** £63.75
**B** £65
**C** £82.50
**D** £71.80
**E** £62.50

59) An aeroplane flies a distance of 49 miles in 7 minutes.
What is the aeroplane's speed in miles per hour?

**A** 400 miles per hour
**B** 490 miles per hour
**C** 420 miles per hour
**D** 410 miles per hour
**E** 400 miles per hour

60) How many cubes with a side length of 4 cm can fit into a cube with a volume of 262,144 cm$^3$?

A  250
B  4,096
C  144
D  123
E  2,300


61) Ralph eats 15 mints out of a packet of 100.
What fraction of the total number of mints remains?

A  3/15
B  1/5
C  3/20
D  17/20
E  1/20


62) Each week, Daniel eats 10$c$ biscuits and 2$t$ slices of toast.
Which expression shows how many biscuits and slices of toast Daniel eats in 84 days?

A  150$t$ + 24$c$
B  120$c$ + 24$t$
C  72$t$ + 24$t$
D  84$t$ + 12$t$
E  120$t$ + 24$c$

**63)** The area of Triangle H, shown below, is equal to the area of Square D. What is the perimeter of Square D?
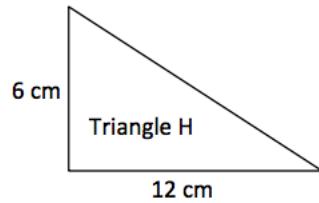


**A** 6 cm
**B** 36 cm
**C** 72 cm
**D** 24 cm
**E** 12 cm

**64)** Which number does not belong with the others?

20   18   36   24   54   72

**A** 18
**B** 24
**C** 54
**D** 20
**E** 72

**65)** If 8 women take 20 days to finish a job, how many days will it take 2 women to finish the same job?

**A** 16
**B** 12
**C** 30
**D** 50
**E** 80

66) All of the Year 9 students in Bop School must study 1 foreign language.
The table below shows the language choices of the current Year 9 students.

| Language | Number of students |
|----------|--------------------|
| Japanese | 32 |
| Greek | 40 |
| German | 55 |
| French | ? |

If ¼ of the Year 9 students study Greek, how many Year 9 students study French?

A  32
B  33
C  30
D  40
E  29

67) In a class, 15 students have brown hair and wear glasses whilst 12 students have black hair and do not wear glasses. There are 15 students in the class with black hair.
21 students in the class wear glasses.
How many students in the class wear glasses and do not have brown hair?

A  0
B  4
C  6
D  3
E  10

68) 8,312 people visited a museum on Saturday and four times as many people visited the museum on Sunday.
What fraction of the museum's visits over this weekend were on Saturday?

A  ⅓
B  ½
C  ¼
D  ⅔
E  ⅕

**69)** Rectangle A is shown below. It has an area of 10,140 cm².



78 m

Rectangle A

130 m
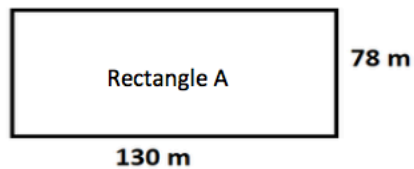
The length of Rectangle B is half the length of Rectangle A.
The width of Rectangle B is the same as the width of Rectangle A.
What is the area of Rectangle B?

**A** 10,140 cm²
**B** 5,070 cm²
**C** 2,500 cm²
**D** 2,535 cm²
**E** 1,000 cm²

**70)** $0.36 + 0.005 + 0.42 = X\%$
What is the value of $X\%$?

**A** 0.785%
**B** 67.4%
**C** 7.85%
**D** 6.74%
**E** 78.5%

**71)** Aran packs 22.5 kg of sugar into smaller bags of 1.5 kg each.
How many smaller bags of sugar can Aran fill?

**A** 15
**B** 18
**C** 20
**D** 70
**E** 45

**72)** Each side of the star shown below has the same length.

If ¾ of the perimeter of the star is 271.2 cm, what is the length of each side of the star?

A  45 cm
B  36.8 cm
C  29.8 cm
D  70.3 cm
E  45.2 cm

**73)** Figure S is formed from identical squares. The perimeter of Figure S is 480 cm.

What is the area of the shaded portion of Figure S?
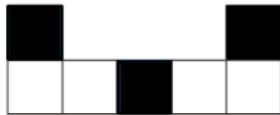
A  900 cm$^2$
B  1.680 cm$^2$
C  1,005 cm$^2$
D  2,700 cm$^2$
E  4,125 cm$^2$

**74)** What is the largest 3-digit number that can be made using 3 different digits?

A  987
B  980
C  988
D  978
E  999

**75)** What is the order of rotational symmetry of the shape below?
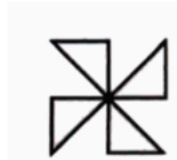


**A** 1
**B** 0
**C** 8
**D** 4
**E** 2

**76)** Which of the following statements about the sum of the days in January, February and March in 2018 is true?

**A** The sum is a multiple of 4.
**B** The sum is an odd number.
**C** The sum is equal to 100.
**D** The sum is a multiple of 15.
**E** The sum is less than 70.

**77)** Which of the following statements about the angle shown below is true?
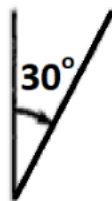


**A** The angle is one-third of a quarter turn.
**B** The angle is a quarter turn.
**C** The angle is half of a quarter turn.
**D** The angle is two-thirds of a quarter turn.
**E** The angle is obtuse.

78) Bob says, "An even number can only be expressed as the sum of 2 odd prime numbers."
Which of the following calculations shows that Bob's statement is false?

**A**  18 = 7 + 11
**B**  14 = 11 + 3
**C**  21 = 19 + 2
**D**  24 = 13 + 11
**E**  8 = 5 + 3

79) A digit is missing from a number that is a multiple of 3:

**65,?90**

Which of the following could be the missing digit?

**A**  3
**B**  8
**C**  9
**D**  6
**E**  4

80) Every week, a plant increases in height by 10% compared to its height the previous week.
If the plant is 20 cm tall, how tall will it be in 2 weeks?

**A**  22 cm
**B**  22.4 cm
**C**  24 cm
**D**  24.2 cm
**E**  25 cm

**81)** If $x = 8$ and $y = 7$, what is the value of $5xy^2$?

**A** 1,840
**B** 1,490
**C** 2,180
**D** 2,040
**E** 1,960

**82)** The weight of a vase is 75.25 kg when empty and 285.25 kg when full of water.
What is the weight of the vase when it is half filled with water?

**A** 142.625 kg
**B** 200.25 kg
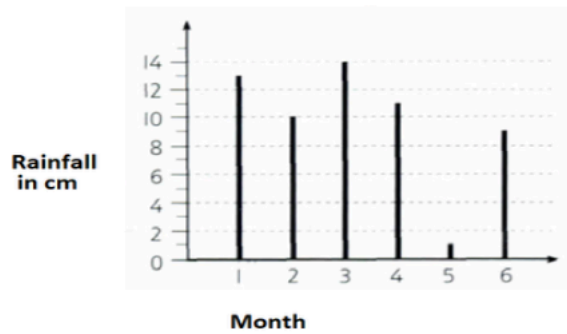**C** 180.25 kg
**D** 204 kg
**E** 196.75 kg

**83)** 1 of the shapes below is selected at random.
What is the probability that the selected shape has more than 1 pair of parallel sides?
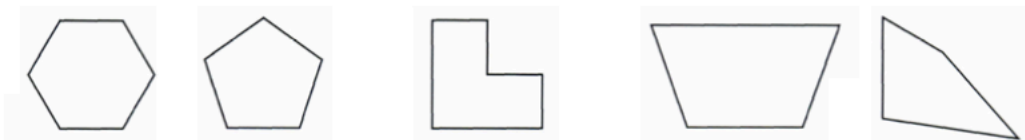


**A** 0.2
**B** 0.6
**C** 0.4
**D** 0.1
**E** 0.5

**84)** This graph shows the rainfall in a town over a 6-month period.
What is the total rainfall over this period?



**Month**

**A** 56 cm
**B** 58 cm
**C** 55 cm
**D** 59 cm
**E** 60 cm


**85)** Mrs Chi bought 12.8 m of cloth. She used 7.9 m of the cloth to make a quilt and half of
the remaining cloth to make 5 identical pillow cases.
How much cloth did she use to make each pillow case?

**A** 49 cm
**B** 21 cm
**C** 18 cm
**D** 20 cm
**E** 29 cm

86) This table shows George's sleeping hours over a 5-day period.

| | Monday | Tuesday | Wednesday | Thursday | Friday |
|---|---|---|---|---|---|
| Goes to sleep | 21:30 | 20:40 | 21:12 | 20:08 | 22:12 |
| Wakes up | 06:45 | 07:00 | 05:40 | 06:15 | 08:12 |

On which day did George sleep the least?

**A** Monday
**B** Tuesday
**C** Wednesday
**D** Thursday
**E** Friday

87) Fred has 40 fish in his fish tank. He removes ⅕ of the fish in the tank and then adds some new fish into the tank. The number of new fish added is equivalent to half of the original number of fish in the tank.
How many fish does Fred now have in his fish tank?

**A** 40
**B** 12
**C** 32
**D** 52
**E** 60

88) Alisha plans to work every day for a full year. She must choose between the following job options.

Job A - Weekly pay of £210
Job B - Daily pay of £36
Job C - Monthly pay of £850
Job D - Fortnightly pay of £410
Job E - Annual pay of £9,600

Which job will pay the most annually?

**A** Job A
**B** Job B
**C** Job C
**D** Job D
**E** Job E

89) The area of each rectangular face of a hexagonal prism is 60 cm².
If the total surface area of the prism is 540 cm², what is the area of each of the hexagonal faces of the prism?

**A** 180 cm²
**B** 150 cm²
**C** 360 cm²
**D** 90 cm²
**E** 208 cm²

90) 2 out of every 11 children at a funfair chose to eat Chinese food. If the total number of children who chose not to eat Chinese food was 531, how many children were there in total at the funfair?

**A** 549
**B** 762
**C** 649
**D** 190
**E** 180

91) How much greater is the product of 8, 9 and 10 than the sum of 8, 9 and 10?

**A** 720
**B** 680
**C** 693
**D** 30
**E** 27

92) 800 people attend a concert. ⅕ of them are from England, 150 are from China and 15% are from Poland. The remainder are from Austria.
How many people attending the concert are from Austria?

**A** 500
**B** 370
**C** 430
**D** 440
**E** 321

93) Tim chooses a month in the year at random.

What is the probability that the name of the month that Tim chooses does not contain the letter 'e'?

**A** 1/3
**B** 1/2
**C** 3/5
**D** 3/4
**E** 1/8

94) The length, breadth and width of a cuboid are $2x$, $x$ and $0.5x$ respectively. The volume of the cuboid is 125 cm$^3$.
What is the width of the cuboid?

**A** 5.5 cm
**B** 6.5 cm
**C** 7.5 cm
**D** 2.5 cm
**E** 3.5 cm

95) The time in London is 6 hours ahead of the time in New York. A plane leaves London at 16:30 local time and lands in New York 8 hours later.
What is the local time in New York when the plane lands?

**A** 18:30
**B** 19:30
**C** 16:00
**D** 19:00
**E** 20:30

96) Calculate 290 × 65 + 35 × 290

**A** 2,900
**B** 16,550
**C** 29,000
**D** 56,120
**E** 12,030

97) A water tank is ⅗ full and has the capacity to hold a further 70 litres of water. What is the maximum capacity of the tank?

**A** 100 litres
**B** 160 litres
**C** 175 litres
**D** 225 litres
**E** 150 litres

98) The number machine below transforms an input into an output.

$$5/12 \quad \boxed{\phantom{xxxx}} \quad 5/108$$
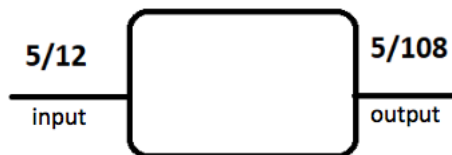
input                                                    output

How does the number machine transform the input number to produce the output?

**A** It multiplies the input by 0.9.
**B** It multiplies the input by 1/9.
**C** It multiplies the input by 9.
**D** It adds 96 to the input.
**E** It multiplies the input number by 1/900.

99) $x°$ and $3x°$ are angles on a straight line. What is the value of $2x°$?

$3x°$   $x°$
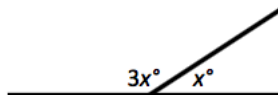
**A** 45°
**B** 40°
**C** 60°
**D** 90°
**E** 120°

**100)** Claire bakes a cake that requires 5½ tablespoons of sugar. Claire uses a teaspoon that can hold ¼ of a tablespoon of sugar.

How many teaspoons of sugar does Claire require for her recipe?

**A** 12
**B** 20
**C** 29
**D** 15
**E** 22

| | | |
|---|---|---|
| 1) C | 46) C | 91) C |
| 2) E | 47) E | 92) B |
| 3) C | 48) D | 93) B |
| 4) B | 49) A | 94) D |
| 5) A | 50) D | 95) A |
| 6) B | 51) E | 96) C |
| 7) E | 52) A | 97) C |
| 8) D | 53) C | 98) B |
| 9) A | 54) C | 99) D |
| 10) B | 55) C | 100) E |
| 11) C | 56) A | |
| 12) B | 57) D | |
| 13) E | 58) A | |
| 14) C | 59) C | |
| 15) A | 60) B | |
| 16) C | 61) D | |
| 17) C | 62) B | |
| 18) B | 63) D | |
| 19) B | 64) D | |
| 20) A | 65) E | |
| 21) B | 66) B | |
| 22) A | 67) C | |
| 23) D | 68) E | |
| 24) C | 69) B | |
| 25) D | 70) E | |
| 26) A | 71) A | |
| 27) D | 72) E | |
| 28) A | 73) D | |
| 29) A | 74) A | |
| 30) A | 75) D | |
| 31) E | 76) D | |
| 32) B | 77) A | |
| 33) D | 78) C | |
| 34) B | 79) E | |
| 35) A | 80) D | |
| 36) A | 81) E | |
| 37) C | 82) C | |
| 38) A | 83) C | |
| 39) D | 84) B | |
| 40) B | 85) A | |
| 41) D | 86) C | |
| 42) E | 87) D | |
| 43) C | 88) B | |
| 44) A | 89) D | |
| 45) D | 90) C | |