



**2020 Wits Mathematics Competition
Qualifying Round
Grades 6 and 7**

Instructions

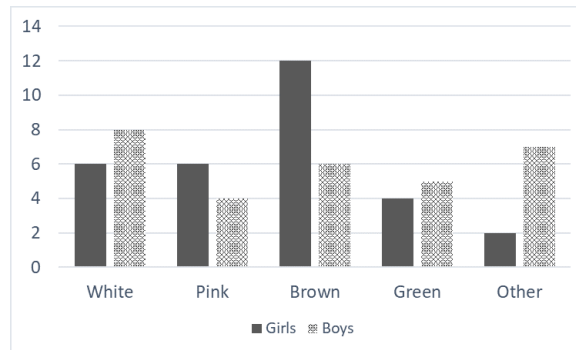
This exam consists of 15 multiple choice questions. There is one correct answer to each question. There is no penalty for incorrect answers. The first 5 questions are each worth 3 points, the next 5 questions are each worth 4 points and the last 5 questions are each worth 5. The total number of points available is 60. The time limit on this exam is 75 minutes, calculators and geometric implements may NOT be used. If you are using the computer friendly answer sheet you should fill it in in BLACK pen (other colours do not scan well). Time may be given for filling in name, school and other personal details.

“The really unusual day would be one where nothing unusual happens.”. — Persi Diaconis

SHARP

A. 3 point questions

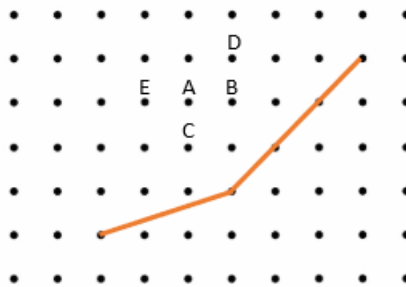
1. 60 children were asked what their favourite colour was. The results are graphed below.



How many more children have brown as their favourite, rather than green?

- A. 8
B. 1
C. 6
D. 5
E. 9
2. Which is the smallest number?
- A. $\frac{7}{20}$
B. $\frac{5}{12}$
C. $\frac{5}{13}$
D. $\frac{2}{5}$
E. $\frac{11}{30}$
3. What is the remainder when 7007010 is divided by 7 ?
- A. 1
B. 2
C. 3
D. 4
E. 5
4. What is the value of $19 + 99 + 19 \times 99$?
- A. 1919
B. 11701
C. 13563
D. 1999
E. 9991

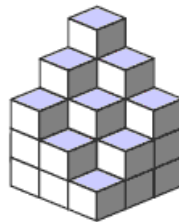
5. Two sides of a parallelogram are shown on the grid. Which of the points shown would be the fourth vertex (corner) of the parallelogram?



- A. *A*
- B. *B*
- C. *C*
- D. *D*
- E. *E*

B. 4 point questions

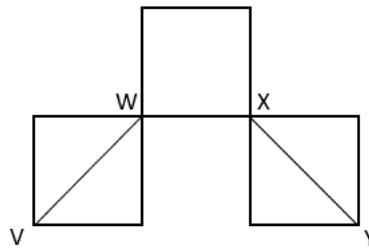
6. The diagram shows a stack of blocks, resting on a three by three base.



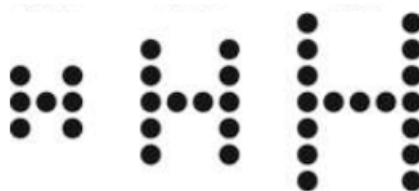
How many blocks are there, including those which cannot be seen?

- A. 27
- B. 15
- C. 33
- D. 37
- E. 9

7. How many different routes are there from V to Y which do not go through any point more than once?



- A. 3
 B. 6
 C. 8
 D. 12
 E. 18
8. A bottle of juice contains 750 ml. Sibongile drinks 50 percent more than Ishaan and they finish the bottle between them. How much does Sibongile drink?
- A. 250ml
 B. 375ml
 C. 400ml
 D. 450ml
 E. 500ml
9. The diagram shows a sequence of H's, created using dots. The pattern continues by adding 2 dots to each vertical line and one dot to the horizontal line.



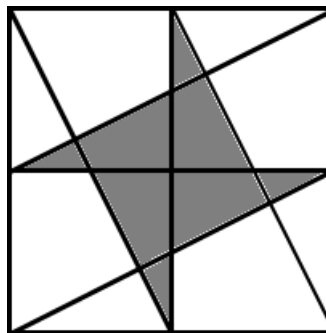
Which picture will have exactly 257 dots?

- A. 49th
 B. 50th
 C. 51st
 D. 52nd
 E. 53rd

10. The 8 digit number 12345A78 is a multiple of 11. Which digit is represented by A ?
- A. 1
 - B. 2
 - C. 5
 - D. 7
 - E. 9

C. 5 point questions

11. The digits of the year 2020 add up to 4. In how many other years (starting from 1), before 2020, has this happened?
- A. 24
 - B. 25
 - C. 26
 - D. 27
 - E. 28
12. In the diagram, a corner of the shaded star touches the middle of each side of the large square.



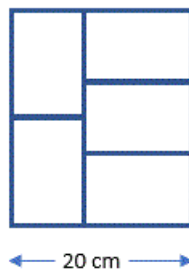
What fraction of the large square is NOT shaded?

- A. $\frac{4}{5}$
- B. $\frac{3}{4}$
- C. $\frac{2}{3}$
- D. $\frac{5}{8}$
- E. $\frac{3}{5}$

13. The MASHER is a kind of calculator. When you type in a number, the MASHER doubles the number, then reverses the digits of this result, then adds 2 and displays the final result. I type in a two digit whole number. Which of the following could be the final result displayed?

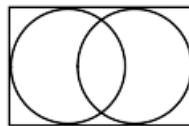
A. 39
B. 41
C. 42
D. 43
E. 45

14. Five identical rectangles fit together to create a larger rectangle, as shown:



What is the area of the larger rectangle?

- A. 240
B. 300
C. 400
D. 480
E. 600
15. Two identical overlapping circles fit exactly inside a rectangle, as shown. The distance between the centres of the circles is 20cm and the perimeter (distance all the way around) of the rectangle is 240cm .



What is the radius of each circle?

A. 12cm
B. 18cm
C. 23cm
D. 25cm
E. 31cm