SEVENOAKS SCHOOL

YEAR 9 (13+) ENTRANCE EXAMINATION

May 2015
for entry in September 2016

MATHEMATICS

Your Name: _____

Your School: _____

Time allowed: 1 hour

Equipment needed: Pen, pencil, eraser, ruler.

Information for candidates:

1. Calculators are NOT allowed.
2. Write your name and school on this page.
3. Write your answers on the question paper in the space provided.
4. There are 15 questions in this paper, try to answer all of them, but don't worry if you don't complete the paper. If you get stuck, just go on to the next question and if you have time at the end come back to the one(s) you left.
5. There are 60 marks in total available for this paper. Marks for each question are shown in square brackets [ ] after the question.
6. Show all your working. You may be awarded marks for correct working even if your final answer is incorrect, and a correct answer unsupported by correct working may not receive full marks.

1. There are 35 offices in a building and each office has 14 phones. The phones are delivered in boxes of 15. How many boxes are needed?

_____ [2]

2. Evaluate the following:

   a) A new car tyre costs £29.99. What is the total cost of 4 new tyres?

   _____ [2]

   b) If 1kg of cheese costs £4.59, find the cost of 250g to the nearest penny.

   _____ [2]

   c) Phone cables cost £0.55 per metre. Calculate the cost of 2.6m of cable.

   _____ [2]

3. Three different dice give scores of 2, 3 and 5. Insert $\div$, $\times$, $+$ *or* $-$ signs to make each calculation work.

   a) 2 ___ 3 ___ 5 = 11

   [2]

   b) 2 ___ (3 ___ 5) = 16

   [2]

   c) (5 ___ 3) ___ 2 = 4

   [2]

4. The diagram shows a trapezium of height 3m.

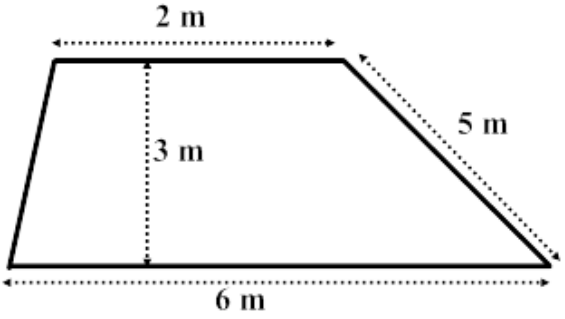
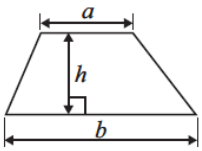


Diagram NOT accurately drawn

Find the area of this trapezium using the formula for the area of a trapezium given below:

$$\textbf{Area of a trapezium} = \frac{1}{2}(a+b)h$$



_____ [2]

5.

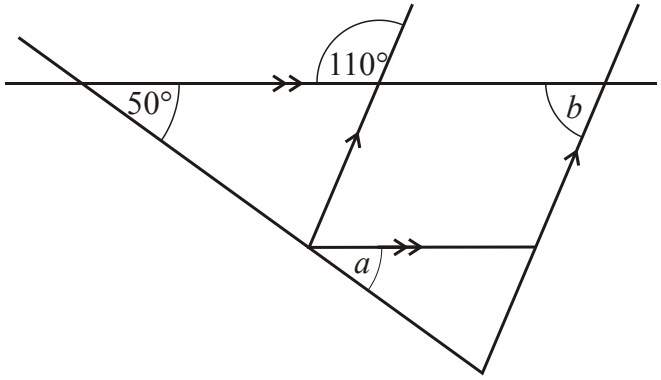


Diagram NOT accurately drawn

a) Work out the size of the angle marked a.

_____ [1]

b) i. Work out the size of the angle marked b.

_____ [2]

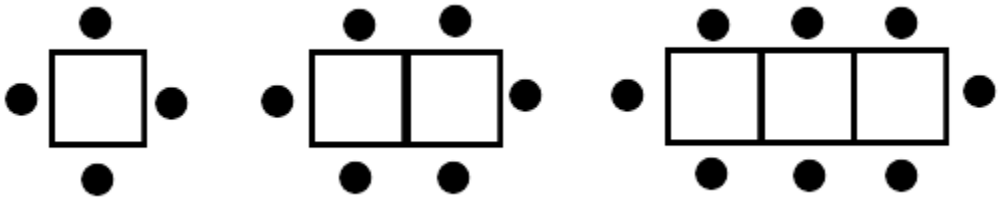
ii. Give reasons for your answer.

_____

_____

_____ [1]

6. Here is a sequence of squares surrounded by dots:



a) How many dots will surround the diagram with a row of 10 squares?

_____ [1]

b) How many squares are in the diagram which has 104 dots?

_____ [1]

c) Can you work out a formula to link the number of dots to the number of squares?

_____ [2]

7. a) Jemima has three cards with the numbers 5, 2 and 11 on them. Find the mean and the median of these three cards.

Mean = _____ [1]

Median = _____ [1]

b) Jemima takes another card and the mean goes up by 2. What number is on the new card?

_____ [2]

8. Calculate the area of the crossed region of the diagram below:

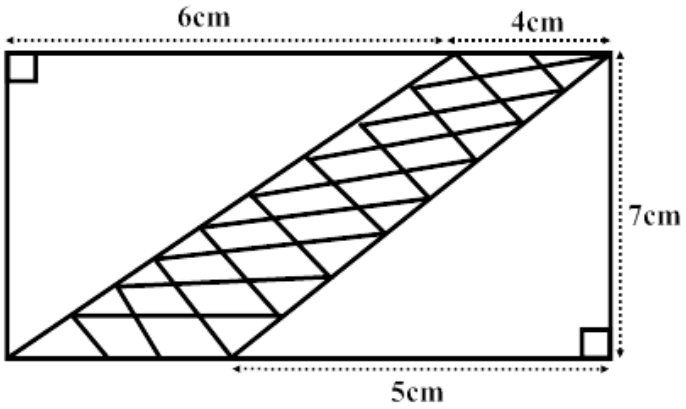


Diagram NOT accurately drawn

_____ [3]

9. Simplify the following expressions:

a) $9a + c - 8a + c$

_____ [1]

b) $a^2 \times a^5$

_____ [1]

c) $10b - 2b^2 - 5b + 11b^2$

_____ [2]

d) $\frac{6b^2}{2b}$

_____ [2]

e) $2(n - 3) - (n - 4)$

_____ [2]

10. Solve the following equations for x :

a) $100 = 5x - 5$

_____ [1]

b) $10(3 + x) = 100$

_____ [1]

c) $3(x + 1) = 2(x + 3) - 6$

_____ [2]

d) $\frac{1}{2}x + \frac{1}{3}x = 5$

_____ [3]

11. Marie earns £340 each week. She is given a 6.5% pay rise. How much does she earn each week after the pay rise?

_____ [2]

12. The length of a piece of string is x cm long. Another piece measures x + 5 cm long. If the second piece is 20% longer than the first, calculate the value of x.

_____ [3]

13. Humpty Dumpty sat on a wall, admiring his new digital watch which displayed hours and minutes only. He noticed that it was 15:21 when Jack and Jill set off up the hill, but that when they later came tumbling down again his watch showed only 10:51 At that point Humpty realised that he'd had his watch on upside down all the time! How long did Jack and Jill take to go up the hill and down again?

_____ [2]

14. In her will Granny Sheldrake left $\frac{1}{3}$ of her money to her sister Emily, $\frac{2}{5}$ of her money to her grandson Eric and the rest to her cat, which was to be looked after by Eric. Eric immediately spent 75% of his inheritance on a new car and put the rest in the bank. When the cat was very old it died and Eric got the cat's share of Granny Sheldrake's money. Eric put this money in the bank. If Emily inherited £45 000, work out:

a) How much money was left to the cat.

_____ [2]

b) How much money Eric had in the bank after the cat died.

_____ [2]

15. The Grand Old Duke of York, he had ten thousand men, he marched them up to the top of the hill…. By 2pm they were one third of the way up. By 4pm they were three quarters of the way up. When did they start?

_____ [3]