Name:

Test of mathematical competence

Time allowed – 20 minutes

1. Use a pencil throughout.

2. For each of the 15 items in this paper there are four options: A, B, C, D. Choose the response that appears to be the best and indicate your choice by underlining the appropriate answer.

   Example:

   What is the square root of 16?

   A 1.6

   B 4

   C 2.5

   D -4

3. Choose one response for each item. Mistakes should be carefully erased and the new choice marked. Make no other marks on the sheet. Any item with more than one answer will score nil.

4. **Attempt all items**; you will score equally for each correct response. There will be no deductions for incorrect responses or omissions.

5. You may use the calculator provided. For any workings, please use the paper provided.

1: What is the value of $(3^3 \times 2) - (\sqrt{25} \times 4) + 7$

A 5
B 81
C 27
D 41

2: After the budget the price of an article was £11.49, which included VAT at 20%.
If the old rate was 15%, what was the old price (including VAT) of the article, to the nearest penny?

A £8.62
B £9.58
C £11.01
D £11.99

3: Find x and y if $0.5x + 0.4y = 11$
$3.5x - 1 = y$

	x	y
A	8	18
B	6	20
C	5	14
D	2	6

4: If the profits of a partnership amounted to £270,000 and partners are to be paid a salary of £20,000 each before dividing the remainder of profits in the ratio 3:2:1, how much in total does the second partner receive?

A £55,000
B £70,000
C £90,000
D £105,000

5: If $\frac{2a - b}{4a + b} = \frac{1}{4}$ and a = 5, what is the value of b?

A 4
B -4
C 2
D -2

6: $64^{-1/3}$ is equal to:

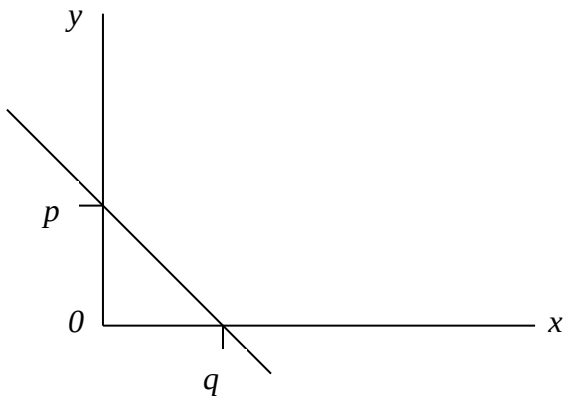
A -4
B 4
C -0.25

D 0.25

7: Which of the following expressions is true?

A $2^5 = 16$
B $38 > \sqrt{81} + 3^3$
C $^{62}/_{7} \approx 7.9$
D $2^2 \times 6 \neq 3(2^4 - 8)$

8: Consider the following graph



What is the equation of the line illustrated above?

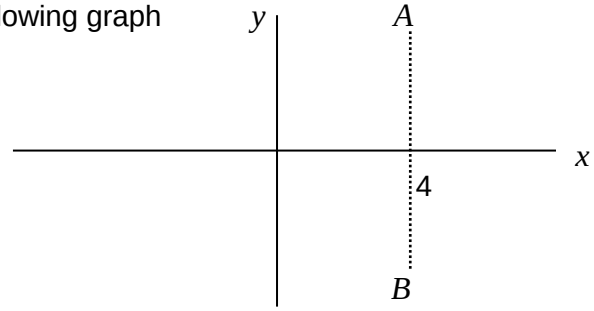
A $y = -\frac{p}{q}x + p$

B $y = \frac{q}{p}x + p$

C $y = -\frac{p}{q}x + q$

D $y = \frac{q}{p}x + q$

9: Consider the following graph



The line AB has the equation

A $x - y = 4$

B $x = 4$
C $y = 4$
D $x + y = 4$

10: The formula for the Economic Order Quantity in stock control is given by:

$$x = \sqrt{\frac{2fs}{h}}$$

If he is made the subject, then h is equal to

A $\frac{4f^2s^2}{x^2}$

B $\frac{x^2}{2fs}$

C $2fs - x^2$

D $\frac{2fs}{x^2}$

11: The value of x which satisfies the equation $2x^2 - 7x + 3 = 0$ is

A 3
B 4
C 2
D 5

12: Sales are predicted to follow this pattern.

Sales of S	1,500 units with probability 0.1 6,000 units with probability 0.9
Sales of T	1,000 units with probability 0.3 6,000 units with probability 0.5 5,000 units with probability 0.2

S requires $2m^2$ of warehouse space per unit, and T requires $3m^2$ of space per unit.

The required warehouse space is expected to be:

A $19{,}400\ m^2$
B $24{,}000\ m^2$
C $25{,}250\ m^2$
D $51{,}000\ m^2$

13: A loan incurs an interest charge of 2% per month.

What is the effective annual percentage rate?

A 2.0%
B 24.0%
C 26.8%
D 29.8%

14: What is the compound interest on £4,000 invested for five years at 6%?

A £1,353
B £1,360
C £5,353
D £5,360

15: What amount would have to be deposited on 1 April 20X5 to total £5,000 on 31 March 20X8 if interest were compound at 7% per annum?

A £4,081
B £3,950
C £4,132
D £4,255