SeaHawk Tutors

Yr 11 Maths Paper 3 (1 hour)

1.

a. Rationalise the denominator of: $\frac{15}{\sqrt{3}}$ [2]

b. Show that $(\sqrt{7} + 2)(\sqrt{28} - 1)$ can be simplified as $3(4+ \sqrt{7})$. [3]

2. Show that $0.\dot{4}\dot{5}$ is equal to $\frac{5}{11}$. [2]

3. ε = {children in Year 9 of a school}
A = {children taller than 120 cm}
B = {children whose birthday is in September, October or November}
C = {children in top set maths}

A Year 9 student is selected at random. She is 115cm tall, with a birthday in April and she is in top set for maths.

(a) Write down the set, A, B or C, of which this student is a member. [1]

(b) Describe in words children that are members of the set $A \cup C$. [2]

$B' \cap A = \varnothing$
(c) Explain what this statement tells us about the students in Year 9. [1]

4.

a. Find the HCF and LCM of 72 and 84 [3]

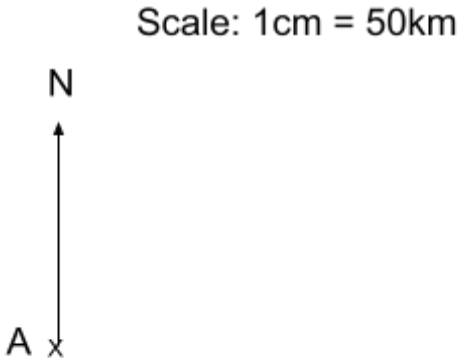
b. 37,800 can be written as $2^3 \times 3^3 \times 5^2 \times 7$. Write 378,000 as the product of its prime factors. [2]

5. The diagram below shows the positions of Albaville (A) and Barkham (B) on a scale map.

a. How far is Albaville from Barkham? [2]

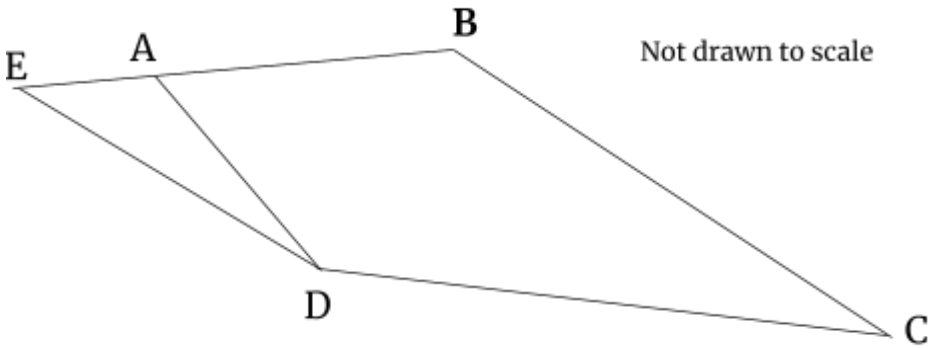
b. What is the bearing of Barkham from Albaville? [2]

c. Culstead is 320km from Albaville on a bearing of 104°. Mark the position of Culstead on the map. [2]



6. In the diagram, EAB is a straight line. ABCD is a quadrilateral with the following angles:

∠ABC = 152°
∠BCD = 47°
∠ADC = 121°
∠EDC = 149°



Find angle AED. Explain your working at each stage. [3]

4

7. $f(x) = 2(x - 12)$ and $g(x) = -x^2$ for $x \in R$.
   a. Write down the range of $g(x)$. [1]

   b. Find $gf(x)$. [2]

   c. Find the values of a that satisfy $f(a) = g(a)$. [3]

8. Three friends make a group that plays the lottery each week. They always split the prize in a fixed ratio. One week they have a win, and they each receive £30, £12 and £18 respectively. A few weeks later the group wins £7,000. How much does each receive this time? [3]

9.

a. In a class of 40 students there are 15 who play a musical instrument. What percentage of the class play an instrument? [2]

b. Bilal is a goalkeeper in a football team. Last season his team conceded 26 goals. This season they have conceded 22 goals. What is the percentage decrease in goals conceded, to the nearest 1%? [2]

c. I put £50 into my bank account. It earns 5.3% interest per annum. How much money will I have in 6 years' time? [3]

10. The first four terms of an arithmetic sequence are 3, 7, 11, 15.

a. Find an expression for the nth term of this sequence. [2]

b. Write down the 100th term of the sequence. [1]

c. Is 199 a term of the sequence? Explain your answer. [2]

d. Find the sum of the first 16 terms of this sequence. [3]