



SeaHawk Tutors

Yr 11 Maths Practice Paper 1 (60 minutes)

1. Evaluate, giving your answer in standard form:

$$2.1 \times 10^5 + 1.8 \times 10^4$$

[2]

2.

a. Expand and simplify: $(x - 2)(2x - 4)$

[2]

b. Factorise: $x^2 + 5x - 24$

[2]

c. Solve: $x^2 + 10x + 24 = 0$

[3]

d. Make t the subject of the equation: $p - t = \frac{1}{2}(t + a)$

[2]

3. A cuboid has sides 3cm, 8cm and x cm. The surface area of the cuboid is 158cm. Find x . [3]

4. Find $\frac{dy}{dx}$ for the equation $y = 2x^4 - \frac{1}{8x^4}$ [2]

5. Calculate, giving your answers as mixed numbers in their simplest form. You must show your working.

a. $3 \frac{3}{4} \times 4 \frac{2}{3}$ [2]

b. $9 \frac{3}{8} - 5 \frac{1}{4}$ [2]

c. $3 \frac{1}{8} \div 1 \frac{2}{3}$ [2]

6.

a. Evaluate:

i. $3^5 \div 3^2$ [1]

ii. $(2^3)^2$ [1]

iii. $\left(\frac{64}{27}\right)^{-\frac{1}{3}}$ [2]

b. Write down the value of:

i. 10^{-2} (as a decimal) [1]

ii. 3.17^0 [1]

c. Simplify: $(16x^3)^{1/2}$ [2]

7. a, 12 and b are three integers, written in size order, smallest first.

The mean of the three numbers is 13.

The range of the three numbers is 7.

Work out the values of a and b.

[2]

8. A quadrilateral is drawn so that each corner touches the circumference of the circle. The angles of the quadrilateral are as shown. Calculate the size in degrees of the missing angle.

[4]

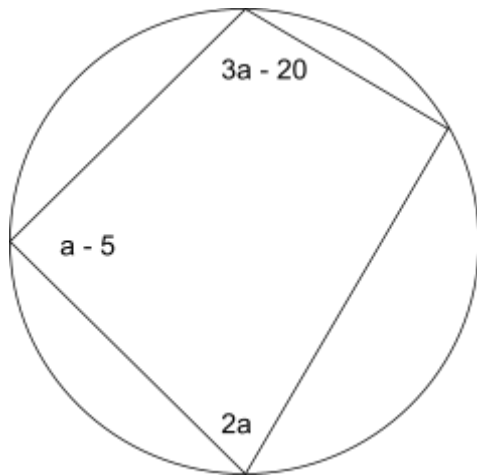


Diagram not drawn accurately.

9. On my way to work I have to drive through 2 sets of traffic lights.
The probability that the first set is green is $\frac{1}{3}$.
The probability that the second set is green is $\frac{1}{2}$ if the first light is green, if not it is $\frac{1}{4}$.

a. Draw a tree diagram to represent this information. [3]

b. What is the probability that I am forced to stop at red lights at both junctions? [2]

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10. $f(x) = 2x + 3$ and $g(x) = -x^2$

a. Find $f(-5)$ [1]

b. Find a given that $f(a) = 8$ [2]

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

d. State the range of $g(x)$ [1]

11. A company makes painted vases in 2 sizes, large and small. The large vase has a surface area of 135cm^2 while the small vase has a surface area of 60cm^2 .

a. The small vase is 12cm tall. How tall is the large vase? [3]

b. The large vase has a volume of 648ml. What is the volume of the small vase? [2]

12. A group of children is surveyed on the sports that they enjoy playing. The survey form is as shown.

Which sports do you enjoy playing? Please put in an X in the box. You can pick as many or as few as you like. If you do not like any of these, please leave all the boxes empty.

| | |
|-----------|--------------------------|
| Football | <input type="checkbox"/> |
| Swimming | <input type="checkbox"/> |
| Athletics | <input type="checkbox"/> |

The responses were as follows:

- 22 children like swimming
- 30 did NOT tick the football box
- 7 like football and athletics
- 11 like athletics and swimming
- 4 like both football and swimming but **not** athletics
- 6 children like all three sports
- 27 only ticked one box
- 7 did not tick any of the boxes

- a. Draw a Venn Diagram to represent this information.

[5]

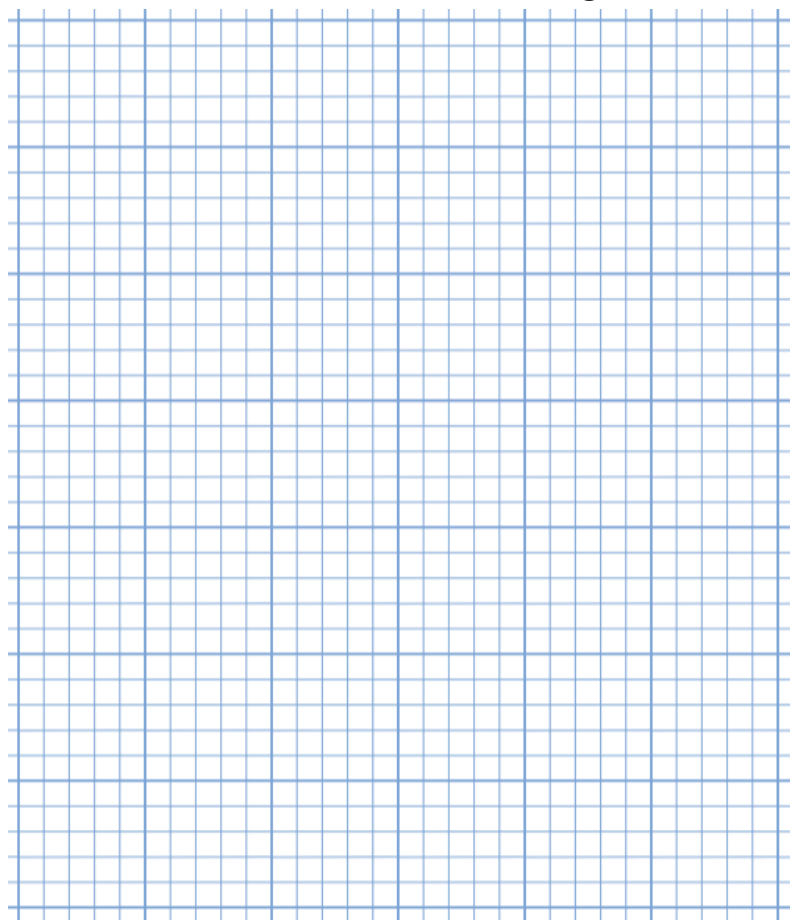
- b. A student who likes swimming is picked at random. What is the probability that this student also likes athletics?

[2]

13. The table shows the weight, w , of a number of plums picked from a fruit tree.

| Weight (g) | Number of plums |
|------------------|-----------------|
| $10 \leq w < 15$ | 8 |
| $15 \leq w < 20$ | 12 |
| $20 \leq w < 25$ | 15 |
| $25 \leq w < 30$ | 10 |
| $30 \leq w < 35$ | 5 |

a. Plot the cumulative frequency graph for this set of data.



[2]

b. The grower can only sell the plums that are at least 22g in weight. Use your graph to estimate the percentage of the fruit that can be sold. [3]