

ELECTRICAL MATHEMATICS

TEST 3 – *TRIAL TEST/ASSIGNMENT*

Notes:

- Test covers graphs/tables, straight line equation, Pythagoras, basic trigonometry & indices.
- The actual test will be closed book, calculator and ruler required.
- It is **ESSENTIAL** to show working/steps, where asked, otherwise **no marks** can be given.

1. From the test results in the table below:

- a. Using graph paper, plot I vs V , including a line of best fit.
(use the graph paper provided on p.6 to answer this question)
- b. From your graph, estimate the current when 7.00 V is applied to the test resistor.

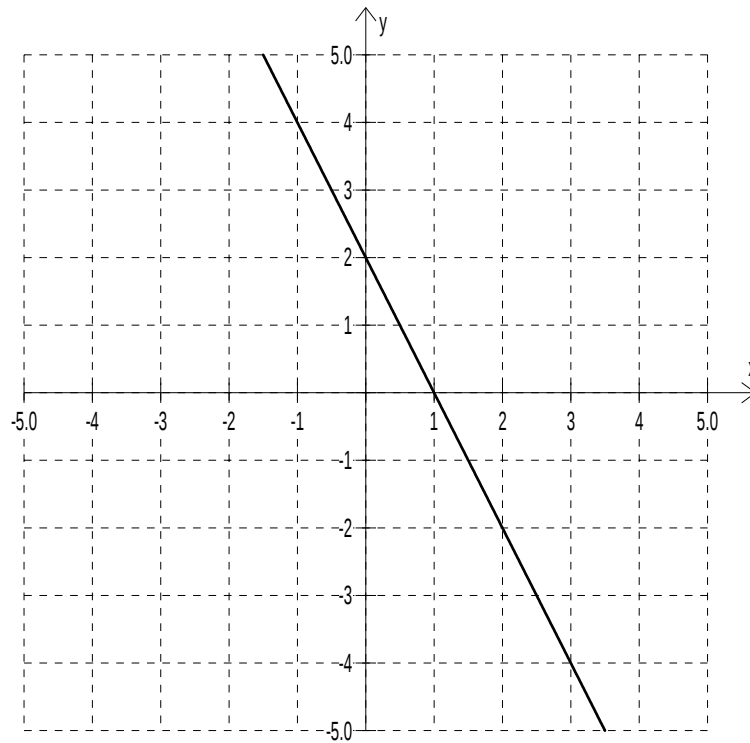
V (V) - applied	0.00	2.00	4.00	6.00	8.00	10.00
I (A) - measured	0.00	0.10	0.21	0.30	0.39	0.49

2. Plot each of the following equations on the **same** set of x-y axes, using the graph paper attached. Clearly identify each plot. (use the graph paper provided on p.7 to answer this question)

- a. $y = 2x + 3$
- b. $2y + 6x + 4 = 0$

3. Determine the gradient **AND** the x and y-intercepts for **BOTH** of the equations in the previous question.

4. Determine the equation of the line in the graph below:



5. Sketch a right-angle triangle, and use it to help state Pythagoras' Theorem.

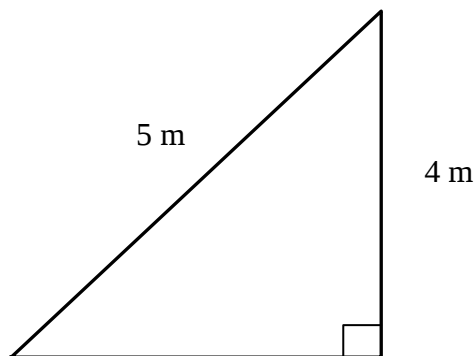
6. Draw a right-angled triangle and use it to help define the SINE, COSINE and TANGENT ratios.

7. TRUE or FALSE

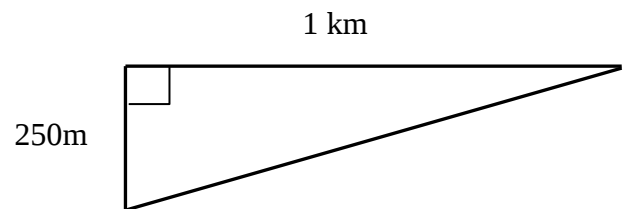
The SINE and COSINE ratios cannot have values outside the range -1 to +1.

8. Determine the length of the unknown side in each of the triangles below.

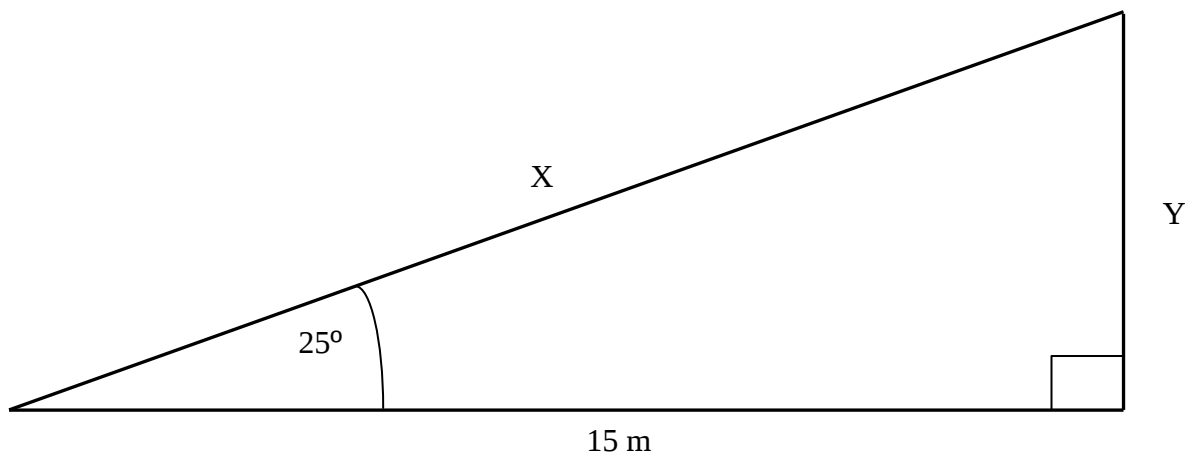
a.



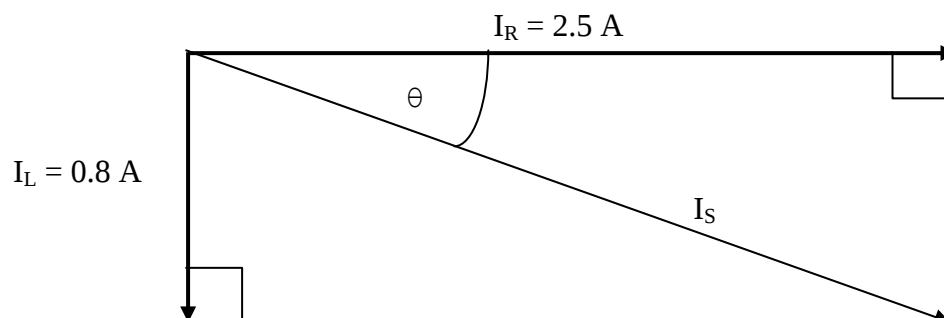
b.



9. Determine the lengths X AND Y in the triangle below, using **only** trigonometry:



10. Calculate I_S and θ in the phasor diagram below:



11. Evaluate the following:

a. $8^{\frac{2}{3}}$

b. $9^{-\frac{1}{2}}$

c. $\sqrt[4]{625}$

d. $\left(\frac{\left(10^{\frac{1}{2}} \times 5^{\frac{1}{5}} \right)^5}{25^{\frac{3}{2}}} \right)^0$

12. Simplify, expressing the answer with **positive** indices only:

a. $x^{-4} \div x^{-7}$

b. $\frac{16a^2 b^3 c^{-1}}{2a^{-3} b^2 c^4}$

c. $(3x^5 y^3)^{-2} (2x^4 y)^2$

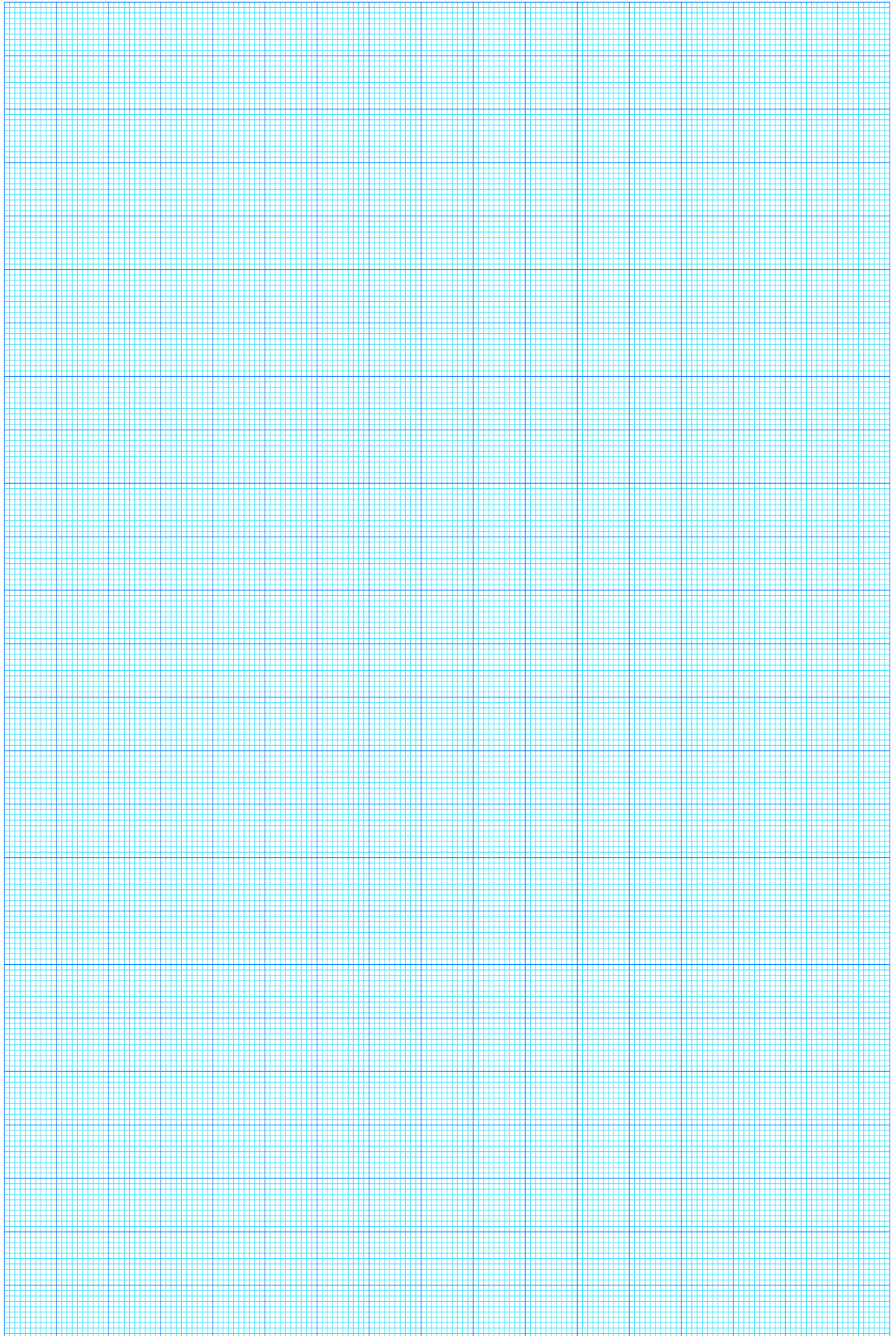
13. Evaluate:

a. $\sqrt[5]{32x^5 y^{10}} x^2 y$

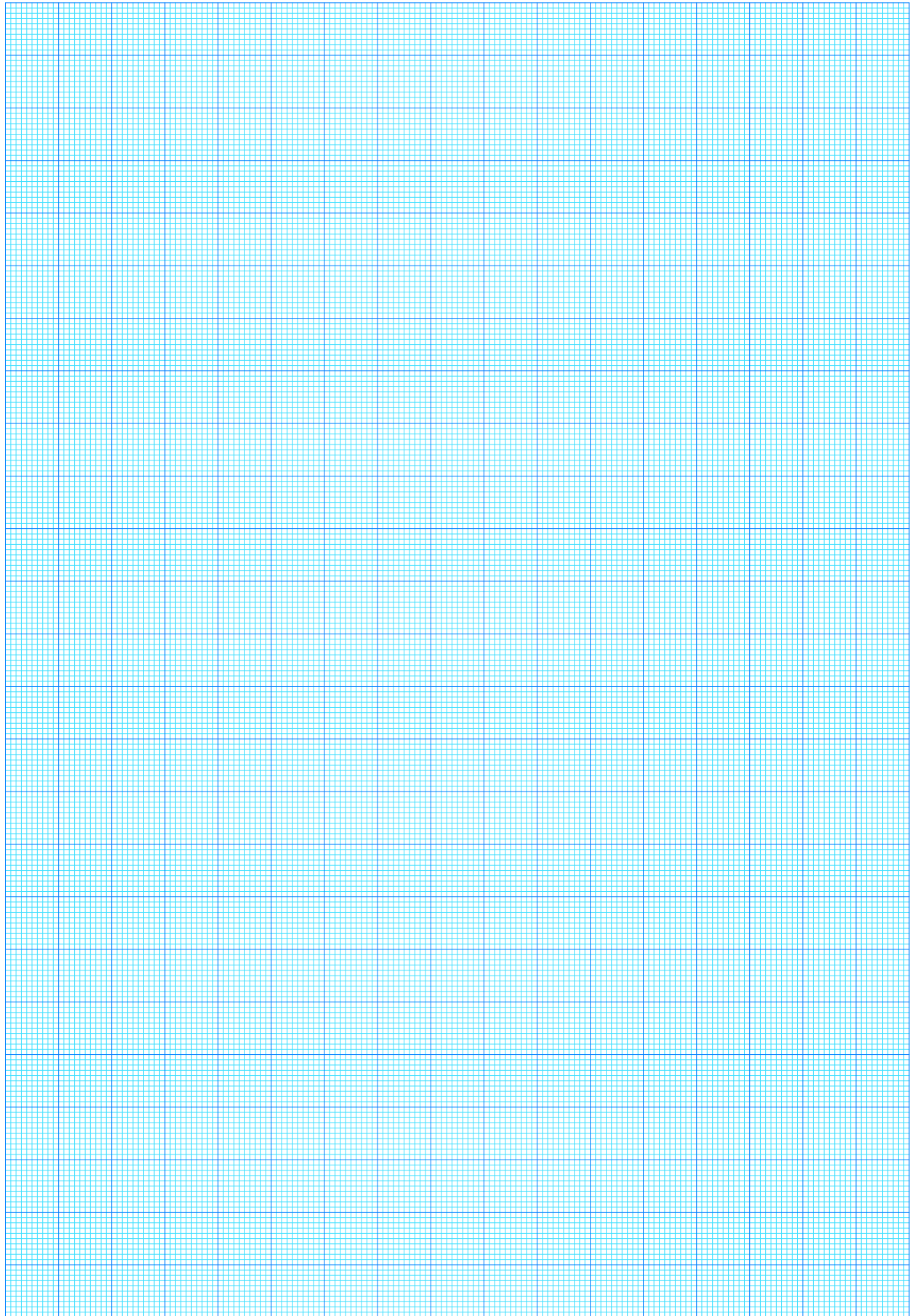
b. $27^{\frac{2}{3}}$

c. $16^{-\frac{1}{4}}$

Question 1 answer.



Question 2 answer.



----- **END OF TRIAL TEST/ASSIGNMENT - *Check your work!*** -----