

Name: _____

ASM Tuition Academy

SURDS

Instructions:

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
- there may be more space than you need.
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all you're working out**.

Information:

- The marks for each question are shown in brackets
- use this as a guide as to how much time to spend on each question.

Advice:

- Read each question carefully before you start to answer it.
- Keep an eye on time.
- Try to answer every question.
- Check your answers if you have time at the end.

1. Write $\sqrt{108}$ in the form $k\sqrt{3}$, where k is an integer

(Total for question 1 is 2 marks)

2. Write $\sqrt{32}$ in the form $k\sqrt{2}$, where k is an integer

(Total for question 2 is 2 marks)

3. Write $5\sqrt{108}$ in the form $k\sqrt{3}$, where k is an integer.

(Total for question 3 is 2 marks)

4. Write $8\sqrt{20}$ in the form $k\sqrt{5}$, where k is an integer

(Total for question 4 is 2 marks)

5. Expand and Simplify $(3 + \sqrt{2})(3 - \sqrt{2})$

(Total for question 5 is 2 marks)

6. Write $(4 + \sqrt{5})^2$ in the form $a + b\sqrt{5}$, where a and b are integers.

(Total for question 6 is 2 marks)

7. Expand and Simplify $(3 + \sqrt{5})(2 - \sqrt{5})$

(Total for question 7 is 2 marks)

8. Write $(4 - \sqrt{2})^2$ in the form $a + b\sqrt{2}$, where a and b are integers

(Total for question 8 is 2 marks)

9. Expand and Simplify $(4 + \sqrt{3})^2 - (4 - \sqrt{3})$

(Total for question 9 is 2 marks)

10. Rationalize the denominator: $9/\sqrt{3}$

(Total for question 10 is 2 marks)

11. Rationalise the denominator: $y/\sqrt{y}$

(Total for question 11 is 2 marks)

12. Rationalise the denominator: $(2 + \sqrt{5}) / \sqrt{2}$

(Total for question 12 is 2 marks)

13. Simplify $(4 + \sqrt{6}) / \sqrt{2}$

(Total for question 13 is 3 marks)

14. Simplify fully: $(5 + 2\sqrt{3})(5 - 2\sqrt{3}) / \sqrt{18}$

(Total for question 14 is 3 marks)

15. Show that $(6 + 2\sqrt{3}) / (2 + \sqrt{3})$ can be written as $6 - 2\sqrt{3}$

(Total for question 15 is 3 marks)

16. Show that $(2\sqrt{2} + 2) / (2 + \sqrt{2})$ can be written as $\sqrt{2}$

(Total for question 16 is 3 marks)

17. Show that $1 / ((1/\sqrt{3}) + (\sqrt{3}))$ can be written as $\sqrt{3} / 4$

(Total for question 17 is 3 marks)

18. Show that $2 / ((1/\sqrt{2}) + 1)$ can be written as $4 - 2\sqrt{2}$

(Total for question 18 is 3 marks)

19. Simplify fully: $(\sqrt{x} + \sqrt{y})(\sqrt{x} - \sqrt{y})$

(Total for question 19 is marks)

20. Simplify fully $(2x + \sqrt{y})^2$

(Total for question 20 is 2 marks)
