

MATHEMATICS SHORT COURSE

Self Assessment Quiz – Answers

1. Express $\frac{g}{p} + \frac{u}{f}$ as a single fraction.

Answer:

$$\frac{g}{p} + \frac{u}{f} = \frac{gf + pu}{pf}$$

2. Express $\frac{f}{t} \times \frac{p}{j}$ as a single fraction.

Answer:

$$\frac{f}{t} \times \frac{p}{j} = \frac{fp}{tj}$$

3. Express $\frac{c}{w} \div \frac{j}{z}$ as a single fraction.

Answer:

$$\frac{c}{w} \div \frac{j}{z} = \frac{cz}{jw}$$

4. Express $\frac{9}{5} + \frac{10}{3}$ as a single fraction and simplify if possible.

Answer:

$$\frac{9}{5} + \frac{10}{3} = \frac{77}{15}$$

5. Express $\frac{9}{3} \times \frac{6y}{20}$ as a single fraction and simplify if possible.

Answer:

$$\frac{9}{3} \times \frac{6y}{20} = \frac{9y}{10}$$

6. Express $\frac{4}{6} \div \frac{14}{15}$ as a single fraction and simplify if possible.

Answer:

$$\frac{4}{6} \div \frac{14}{15} = \frac{5}{7}$$

7. Express $\frac{7}{x+1} - \frac{-5x-3}{x}$ as a single fraction and simplify if possible.

Answer:

$$\frac{7}{x+1} - \frac{-5x-3}{x} = \frac{5x^2 + 15x + 3}{x(x+1)}$$

8. What is $\sqrt{81}$?

Answer:

$$\sqrt{81} = \pm 9$$

9. Which is the simplified version of $\sqrt{r^2 + 81s^2}$?

- A. $r - 9s$ B. $r + 9s$ C. $9(r + s)$ D. $9(r - s)$ E. It cannot be simplified

Answer: E. It cannot be simplified

10. Expand $(x + 6)(6x + 6)$.

Answer:

$$(x + 6)(6x + 6) = 6x^2 + 42x + 36$$

11. Simplify $-7(2x - 6) - (5x - 8)$.

Answer:

$$-7(2x - 6) - (5x - 8) = -19x + 50$$

12. Expand and simplify $(2p + 7q)(5p - 8q) + q^2$

Answer:

$$(2p + 7q)(5p - 8q) + q^2 = 10p^2 + 19pq - 55q^2$$

13. Express $\sqrt[5]{10}$ as a single power of 10

Answer:

$$\sqrt[5]{10} = 10^{\frac{1}{5}}$$

14. Express $\frac{(10^9)^9 \times (10^7)^1}{(10^2)^9}$ as a single power of 10.

Answer:

$$\frac{(10^9)^9 \times (10^7)^1}{(10^2)^9} = 10^{70}$$

15. What is the value of $\log_{10} \left(\frac{(10^9)^4 \times (10^9)^2}{(10^3)^9} \right)$

Answer:

$$\log_{10} \left(\frac{(10^9)^4 \times (10^9)^2}{(10^3)^9} \right) = 27.$$

16. What is the value of $\log_{10}(10^{-7})$?

Answer:

$$\log_{10}(10^{-7}) = -7.$$

17. What is the value of $\log_{10} 0.01 + \log_{10} 0.01$?

Answer:

$$\log_{10} 0.01 + \log_{10} 0.01 = -4$$

18. Solve for x in the equation $5x + 9 = -1$.

Answer:

$$5x + 9 = -1 \Rightarrow x = -2$$

19. Solve for x in the equation $-\frac{1}{6}x + 4 = 10$.

Answer:

$$-\frac{1}{6}x + 4 = 10 \Rightarrow x = -36$$

20. Find the roots of the $(-2x + 2)(-6x - 3) = 0$

Answer:

$$(-2x + 2)(-6x - 3) = 0 \Rightarrow x = 1 \text{ or } x = -\frac{1}{2}.$$

21. Find the roots of $x^2 + 11x = -28$.

Answer:

$$x^2 + 11x = -28 \Rightarrow x = -4 \text{ or } x = -7.$$

22. Find the roots of $x^2 - 16 = 0$.

Answer:

$$x^2 - 16 = 0 \Rightarrow x = -4 \text{ or } x = 4.$$

23. Find the roots of $x^2 - 6x - 7 = 0$.

Answer:

$$x^2 - 6x - 7 = 0 \Rightarrow x = -1 \text{ or } x = 7.$$

24. Find the roots of $4x^2 + 18x + 20 = 0$.

Answer:

$$4x^2 + 18x + 20 = 0 \Rightarrow x = -2 \text{ or } x = -\frac{5}{2}.$$

25. Simplify the expression $\frac{x^{-8}y^8}{(x^{-3}y^{-8})^{-6}}$.

Answer:

$$\frac{x^{-8}y^8}{(x^{-3}y^{-8})^{-6}} = x^{-26}y^{-40}$$

26. Factorise $-4x^9y + 4x^2y$

Answer:

$$-4x^9y + 4x^2y = -4x^2y(x^7 - 1) = 4x^2y(1 - x^7)$$

27. If $\frac{1}{y} - 8x = -9$, find the formula which gives y in terms of x . (That is, rearrange the formula to get $y = f(x)$.)

Answer:

$$\frac{1}{y} - 8x = -9 \Rightarrow y = \frac{1}{8x - 9}$$

28. If $\log_{10} x = -1$, what is x ?

Answer:

$$\log_{10} x = -1 \Rightarrow x = 0.1$$

29. If $4^x = 256$, what is x ?

Answer:

$$4^x = 256 \Rightarrow x = 4$$

30. Express $(5^{-x})^2(5^y)^4$ as a single power of 5.

Answer:

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