MATHEMATICS SHORT COURSE

Self Assessment Quiz

Instructions

Complete the following 30 questions. **Time limit is 50 minutes.** Each question is worth one point. Calculators are not permitted. The pass mark is 27 out of 30. (If you cannot pass this quiz without difficulty, then you should seriously consider attending the Mathematics Boot Camp.)

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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