

Algebra Worksheet §1.1

Zac Zerafa

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I've tailored these questions to the algebra section of your upcoming test; hopefully this covers the bulk of questions that they will ask you. I've marked the more 'nonstandard' questions with an (*); I'd recommend you to try the other questions first and then try and tackle these harder ones.

If you need any help or clarification regarding these questions, feel free to message me at 0491157813. All the best!

1 Warmup

1. Solve x when $3x + 2 = 0$
2. Solve x when $3x^2 + 9x = 0$
3. Solve x when $5 + x = 4x + 20$
4. Solve for x and y when $x + 5y = 17$ and $-7x + 3y = -5$
5. Solve for x and y when $5x + 7y = 20$ and $6x - 2y = 5$

2 Surds

1. Simplify $\sqrt{6}$.
2. Simplify $\sqrt{150} + \sqrt{54}$.
3. Simplify $2\sqrt{32} + \sqrt{18} - 3\sqrt{8}$.
4. Simplify $2\sqrt{2} \times \sqrt{3}$.
5. Simplify $\sqrt{3}(3 + 2\sqrt{3})$.
6. Simplify $\frac{\sqrt{7}}{3\sqrt{5}-2}$.

7. Simplify $\sqrt{827}$.
8. Simplify $(2\sqrt{3})^3 - \frac{12}{\sqrt{3}}$.(*)
9. Evaluate $\frac{\sqrt{50}+\sqrt{18}}{\sqrt{8}}$ (you should arrive at an integer as your solution).(*)
10. Simplify $\frac{2}{3\sqrt{5}+7}$.
11. Solve z when $\frac{1+z}{z} = \sqrt{2}$.

3 Quadratics

1. Solve x when $x^2 - 11x + 24 = 0$.
2. Solve x when $x^2 - 7x + 12 = 0$.
3. Solve x when $x^2 + 3x - 28 = 0$.
4. Solve x when $x^2 + 6x + 7 = 0$.
5. Solve x when $x^2 + 4x - 14 = 0$.
6. Solve x when $x^2 - 18x + 33 = 0$.

4 Logarithms

1. Solve for t when $3^t = 40$ to 3 decimal places.
2. Solve for t when $6^{2-t} = 400$ to 3 decimal places.
3. Solve for t when $3^{2t-1} = 4$ to 3 decimal places.
4. Solve for t when $5 \times 2^{t-1} = 2 \times 5^{2t}$.(*)
5. Simplify $\log_{10}(5) + \log_{10}(7)$.
6. Simplify $\log_{10}(35) - \log_{10}(7)$.
7. Simplify $\log_6(10) + \log_6(9)$.
8. Simplify $\log_6(7^9) + \log_6(49)$.
9. Calculate $\log_6(206)$ to 5 decimal places.
10. Calculate $\log_5(66)$ to 5 decimal places.

5 Graphing algebraic functions

1. Graph $y = -7x + 2$; ensure to label the y-intercept and x-intercept.
2. Graph $y = x^2 - 11x + 24$; ensure to label the y-intercept, x-intercepts and the vertex.
3. Graph $y = x^2 - 18x + 33$; ensure to label the y-intercept, x intercepts and the vertex.
4. Using your previous answer, graph $y = (x - 2)^2 - 18(x - 2) + 33$; ensure to label the y-intercept, x intercepts and the vertex.
5. Graph $y = 3^x$; ensure to label the y-intercept and asymptote.
6. Using your previous answer, graph $y = 3^{x+3} - 3$; ensure to label the y-intercept, x-intercept and asymptote.
7. Graph $y = \log_3(x-2)$; ensure to label the y-intercept, x-intercept, and the asymptote. (*)