

Routine Algebra Test #2

1. Simplify fully: $2x^{-2} \times 6x^4$
2. Simplify fully: $(ab)^4$
3. Simplify fully: $\frac{4x}{2xy}$
4. Simplify fully: $\frac{3y}{6y^3}$
5. Expand and simplify: $x(3 + y)$
6. Expand and simplify: $2(x + 5) + 6(x + 2)$
7. Expand and simplify: $(x + 2)(x + 10)$
8. Expand and simplify: $(x - 1)(x - 4)$
9. Factorise fully: $9k + 12$
10. Factorise fully: $x^2 - 6x$
11. Factorise fully: $x^2 + 12x + 35$
12. Factorise fully: $x^2 + 2x - 3$
13. Solve: $1.7 + 2x = 2.3$
14. Solve: $21 = 9x + 4$
15. Solve: $x - 15 = 7x$
16. Solve: $5x + 7 = 3x + 3$
17. Solve: $2(x + 3) = 1 - x$
18. Solve: $\frac{2}{x+1} = 5$
19. Calculate $C = x^2 + 3x$ when $x = -5$
20. Calculate $D = \frac{x+5}{x+3}$ when $x = 1$

Answers: Routine Algebra Test #2

1. $2x^{-2} \times 6x^4 = 2 \times 6 \times x^{-2} \times x^4 = 12x^2$
2. $(ab)^4 = ab \times ab \times ab \times ab = a^4b^4$
3. $\frac{4x}{2xy} = \frac{\cancel{2x} \times 2}{\cancel{2x} \times y} = \frac{2}{y}$ (or $2y^{-1}$)
4. $\frac{3y}{6y^3} = \frac{\cancel{3y} \times 1}{\cancel{3y} \times 2y^2} = \frac{1}{2y^2}$ (or $\frac{1}{2}y^{-2}$)
5. $x(3 + y) = x \times 3 + x \times y = 3x + xy$
6. $2(x + 5) + 6(x + 2) = 2x + 10 + 6x + 12 = 8x + 22$ (any order)
7. $(x + 2)(x + 10) = x^2 + 10x + 2x + 20 = x^2 + 12x + 20$ (any order)
8. $(x - 1)(x - 4) = x^2 - 4x - 1x + 4 = x^2 - 5x + 4$ (any order)
9. $9k + 12 = 3 \times 3k + 3 \times 4 = 3(3k + 4)$
10. $x^2 - 6x = x \times x - x \times 6 = x(x - 6)$
11. $x^2 + 12x + 35$ $35 = 35 \times 1$ and 7×5 $= (x + 5)(x + 7)$ or $(x + 7)(x + 5)$
12. $x^2 + 2x - 3$ $-3 = -1 \times 3$ and 1×-3 $= (x + 3)(x - 1)$ or $(x - 1)(x + 3)$
13. $1.7 + 2x = 2.3$ $\cancel{1.7} - \cancel{1.7} + 2x = 2.3 - 1.7$ $x = \frac{0.6}{2}$ $x = 0.3$
14. $21 = 9x + 4$ $21 - 4 = 9x + \cancel{4} - \cancel{4}$ $17 = 9x$ $x = \frac{17}{9} = 1.8889$
15. $x - 15 = 7x$ $\cancel{-15} + \cancel{-x} = 7x - x$ $x = \frac{-15}{6}$ $x = \frac{-5}{2} = -2.5$
16. $5x + 7 = 3x + 3$ $5x - 3x + \cancel{7} - \cancel{7} = \cancel{3x} - \cancel{3x} + 3 - 7$ $x = -2$
17. $2(x + 3) = 1 - x$ $2x + 6 = 1 - x$ $3x + x = 1 - 6$ $x = \frac{-5}{3} = -1.6667$
18. $\frac{2}{x+1} = 5$ $2 = 5(x + 1)$ $2 = 5x + 5$ $x = \frac{-3}{5} = -0.6$
19. $C = x^2 + 3x$ if $x = -5$ $= (-5)^2 + (3 \times -5) = 25 + -15 \Rightarrow C = 10$
20. $D = \frac{x+5}{x+3}$ if $x = 1$ $= \frac{1+5}{1+3} = \frac{6}{4} \Rightarrow D = 1.5$