

1-22: Simplify each operation. Assume that no variable equals 0.

1. $b^4 \cdot b^3$ (b^7)

2. $c^5 \cdot c^2 \cdot c^2$ (c^9)

3. $a^{-4} \cdot a^{-3}$ $\frac{1}{a^4 \cdot a^3} = \left(\frac{1}{a^7}\right)$

4. $x^5 \cdot x^{-4} \cdot x$ $\frac{x^5}{x^4} \cdot x = \frac{x^6}{x^4} = (x^2)$

5. $(2x)^2(4y)^2$ $(2x)(2x)(4y)(4y)$
 $4x^2 \cdot 16y^2 = (64x^2y^2)$

6. $-2gh(g^3h^5)$ $(-2g^4h^6)$

7. $10x^2y^3(10xy^8)$ $(100x^3y^{11})$

8. $\frac{24wz^7}{3w^3z^5}$ $\left(\frac{8z^2}{w^2}\right)$

9. $\frac{-6a^4bc^8}{36a^7b^2c}$ $\left(\frac{-c^7}{6a^3b}\right)$

10. $\frac{-10pt^4r}{-5p^3t^2r}$ $\left(\frac{2t^2}{p^2}\right)$

11. $(g+5) + (2g+7)$ $(3g+12)$

12. $(5d+5) - (d+1)$ $(4d+4)$
 $-d-1$

13. $(x^2-3x-3) + (2x^2+7x-2)$
 $(3x^2+4x-5)$

14. $(-2f^2-3f-5) + (-2f^2-3f+8)$
 $(-4f^2-6f+3)$

15. $-5(2c^2-d^2)$
 $(-10c^2+5d^2)$

16. $x^2(2x+9)$
 $(2x^3+9x^2)$

17. $(a-5)^2$
 $(a-5)(a-5) = a^2 - 5a - 5a + 25$
 $(a^2 - 10a + 25)$

18. $(2x-3)(3x-5)$
 $6x^2 - 10x - 9x + 15$
 $(6x^2 - 19x + 15)$

19. $(r-2t)(r+2t)$
 $r^2 + 2rt - 2rt - 4t^2 = (r^2 - 4t^2)$

20. $(3y+4)(2y-3)$
 $6y^2 - 9y + 8y - 12$
 $(6y^2 - y - 12)$

21. $(3-2b)(3+2b)$
 $9 + 6b - 6b - 4b^2$
 $(9 - 4b^2)$

22. $(3w+1)^2$
 $(3w+1)(3w+1)$
 $9w^2 + 3w + 3w + 1$
 $(9w^2 + 6w + 1)$