

# Algebra Book Answers

#### 4] Indices

1. a)  $m^{3+6} = m^9$

b)  $p^{8-2} = p^6$

c)  $(2n^3)^4 = 2^4 \cdot n^{3 \times 4}$   
 $= 16n^{12}$

2. a)  $m^{6+7} = m^{13}$

b)  $x^0 = 1$

3. a)  $m^{5-3} = m^2$

b)  $5x^6y^4$

4. a)  $a^9$       b)  $9e^5f^6$

5. a)  $m^6$       b)  $y^2$

c)  $m^{3 \times 5} = m^{15}$

6. a)  $p^9$       b)  $6q^6$

c)  $32x^5y^{15}$

7. a)  $5y^4$       b)  $21w^4x^3$

8. a)  $(2^2)^3 = (4)^3 = 64$

b)  $4^{-2} = \frac{1}{4^2} = \frac{1}{16}$

c)  $\sqrt{24 \times 9} = \sqrt{16 \times 9}$   
 $= \sqrt{16} \times \sqrt{9}$   
 $= 4 \times 3 = 12$

9. a)  $x^4$       b)  $y^{12}$

10.  $2 \times y \times y$

11.  $7^{5+6} = 7^{3+K}$

$7^{11} = 7^{3+K} \rightarrow 3+K=11$

$K = 11 - 3$

$\therefore K = 8$

12.  $9^{3+4+1-2} = 9^6$

13.  $3b^{-3} = \frac{3}{b^3}$

14. a)  $4(1) = 4$

b)  $\frac{1}{(2x)^2} = \frac{1}{4x^2}$

c)  $7^{2+3-1} = 7^4$

$$15. 7^{3+m+2} = 7^{5+(-1)}$$

$$7^{5+m} = 7^4 \rightarrow 5+m=4$$

$$\cdot m = -1$$

$$16. m = 4+8 = 12$$

$$n = 8-4 = 4$$

$$17. 2 \times 8 \times a \times a \times b$$

$$32 \times a \times a \times a \div (2 \times a) \times b$$

$$18. 5g^3 \div 8h^2 = \frac{5g^3}{8h^2}$$

$$19. x = 2, y = 6$$

$$x = 4, y = 3$$

$$x = 8, y = 2$$

$$x = 64, y = 1$$

$$20. a) 2^2 \quad b) 3^5$$

$$c) 2^{13} \quad d) 2^{10}$$

$$e) 5^6$$

$$21. (x^c y^2)^d = x^{24} y^6$$

$$x^{cd} \cdot y^{2d} = x^{24} y^6$$

$$2d = 6 \rightarrow \cdot d = \frac{6}{2} = 3$$

$$cd = 24 \rightarrow 3c = 24$$

$$\cdot c = \frac{24}{3} = 8$$

$$22. a) 3^{2-4} = 3^y$$

$$3^{-2} = 3^y \rightarrow y = -2$$

$$b) 10^{6-y} = 10^2$$

$$6-y = 2 \rightarrow y = 6-2 = 4$$

$$c) 14^{2-y} = 14^{-4}$$

$$2-y = -4 \rightarrow y = 2+4 = 6$$

$$d) 8^{y-3} = 8^4$$

$$y-3 = 4 \rightarrow y = 4+3 = 7$$

$$23. a) 2^{3+x} = 2^9$$

$$3+x = 9 \rightarrow x = 9-3 = 6$$

$$b) 3^{2+x} = 3^{-2}$$

$$2+x = -2 \rightarrow x = -2-2 = -4$$

$$c) 5^{-3+x} = 5^{-5}$$

$$-3+x = -5 \rightarrow x = -5+3$$

$$\cdot x = -2$$

$$d) x-3 = 1 \rightarrow x = 4$$

$$24. \text{No, } 5^3 = 5 \times 5 \times 5$$

$$= 125$$

$$25. \text{root } 3a^6 = 1.7a^2$$

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