

Module 7 Review Solutions

1. $3^{-4} = \frac{1}{3^4} = \frac{1}{3 \cdot 3 \cdot 3 \cdot 3} = \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3}$

b.) $7^{-2} = \frac{1}{7^2} = \frac{1}{7 \cdot 7} = \frac{1}{7} \cdot \frac{1}{7}$

2. a.) $4^4 = 256$ b.) $4^3 = 64$ c.) $4^2 = 16$ d.) $4^1 = 4$

e.) $4^0 = 1$ f.) $4^{-1} = \frac{1}{4^1} = \frac{1}{4}$ g.) $4^{-2} = \frac{1}{4^2} = \frac{1}{16}$

h.) $4^{-3} = \frac{1}{4^3} = \frac{1}{64}$ i.) $4^{-4} = \frac{1}{4^4} = \frac{1}{256}$

3. a.) $7,890,000,000 = 7.89 \times 10^9$

so $7,890,000,000 > 7.89 \times 10^8$

b.) $0.000000324 = 3.24 \times 10^{-7}$

so $0.000000324 < 3.24 \times 10^{-6}$

4. $9.41 \times 10^8 = 941,000,000$

5. $-0.000059 = -5.9 \times 10^{-5}$

6. $(9x^{-5}y^{-3})^{-2} = 9^{-2}x^{10}y^6 = \frac{x^{10}y^6}{9^2} = \frac{x^{10}y^6}{81}$

7. $\left(\frac{64a^3b^2}{4ab^2}\right)^{-2} = \left(\frac{16a^2}{1}\right)^{-2} = \left(\frac{1}{16a^2}\right)^2 = \frac{1}{16^2a^4} = \frac{1}{256a^4}$

8. $(2rs^2t^3)^2(-6r^2st^3)^3 = (4r^2s^4t^6)(-216r^6s^3t^9)$
 $= -864r^8s^7t^{15}$

9. $\frac{(-2x^2y)^3}{(6xy^2)^2} = \frac{-8x^6y^3}{36x^2y^4} = \frac{-1x^4}{4y} = \frac{-x^4}{4y}$

$$10. (3x^2 + 4x - 5) + (-5x^2 - 4x + 7) = \boxed{-2x^2 - x + 2}$$

$$11. (4x^4 + 2x^3 - 6x + 12) - (3x^5 - 2x^3 + 10) = \boxed{-3x^5 + 4x^4 + 4x^3 - 6x + 2}$$

$$12. (2x+5)(3x-4) = 6x^2 - 8x + 15x - 20 = \boxed{6x^2 + 7x - 20}$$

$$13. (5x^2 - 3)(2x^2 + 6x - 7) = 5x^2(2x^2 + 6x - 7) - 3(2x^2 + 6x - 7)$$

$$= 10x^4 + 30x^3 - 35x^2 - 6x^2 - 18x + 21$$

$$= \boxed{10x^4 + 30x^3 - 41x^2 - 18x + 21}$$

$$14. (4x-5)^2 = (4x-5)(4x-5) = 16x^2 - 20x - 20x + 25$$

$$= \boxed{16x^2 - 40x + 25}$$

$$15. \underset{8x \cdot 8x}{64x^2} - \underset{11y \cdot 11y}{121y^2} = \boxed{(8x+11y)(8x-11y)}$$

$$16. \underset{5x \cdot 5x}{25x^2} - 70x + \underset{7 \cdot 7}{49} = (5x-7)(5x-7) = \boxed{(5x-7)^2}$$

$$17. 2x^2 - 12x - 110 = 2[x^2 - 6x - 55]$$

$$= \boxed{2(x-11)(x+5)}$$

factors of	sum to
-55	-6
(-11)(5)	-11+5 = -6 ✓

$$18. 3x^3 - 2x^2 - 21x = x[3x^2 - 2x - 21]$$

$$= x[\underline{3x^2 - 9x} + \underline{7x - 21}]$$

$$= x[3x(x-3) + 7(x-3)]$$

$$= \boxed{x(x-3)(3x+7)}$$

factors of	sum to
(3x-21)	-2
-63	-2
-9 \cdot 7	-9+7 = -2 ✓