(1.2) Exercises 9-19, 22, 25-27, 33, 37, 42 Pages 13-14

(9) $3^5 = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3$

$= 9 \cdot 9 \cdot 3$

$= 81 \cdot 3$

$= \underline{243}$

(10) $4^3 = 4 \cdot 4 \cdot 4$

$= 16 \cdot 4$

$= \underline{64}$

(11) $2^4 = 2 \cdot 2 \cdot 2 \cdot 2$

$= 4 \cdot 4$

$= \underline{16}$

(12) $10^8 = 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$

1 · 1 is always going to be 1

Count the zeros

Add 8 zeros to 1 to get the answer

$\underline{100,000,000}$

(13) $\left(\frac{2}{3}\right)^3 = \frac{2}{3} \cdot \frac{2}{3} \cdot \frac{2}{3}$

Multiply numerator by numerator and denominator by denominator

$2 \cdot 2 \cdot 2 = 4 \cdot 2 = 8$

$3 \cdot 3 \cdot 3 = 9 \cdot 3 = 27$

$\underline{\frac{8}{27}}$

(14) $\left(\frac{1}{2}\right)^4 = \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2}$

$= \frac{1}{4} \cdot \frac{1}{4}$

$= \underline{\frac{1}{16}}$

(15) $0.4^6 = (0.4) \cdot (0.4) \cdot (0.4) \cdot (0.4) \cdot (0.4) \cdot (0.4)$

16 16 16

256

4096

Count the decimal places in the expanded part above. There are 6.

$\underline{0.004096}$

(16) $7^4 = 7 \cdot 7 \cdot 7 \cdot 7$

$= 49 \cdot 49$

$= \underline{2401}$

(17) $20 - 2 \cdot 3^2$

$20 - 2 \cdot 9$ Simplify 3^2 first GEMDAS

$20 - 18$ Take care of multiplication GEMDAS

2 Finally, subtraction GEMDAS

G rouping Symbols
E xponents
M ultiplication
D ivision
A ddition
S ubtraction

(18) $6 + 4 \div 2 + 3$ GEMDAS

$6 + 2 + 3$ GEMDAS

$8 + 3$

11

(19) $(6^2 - 3^3) \div 2$ GEMDAS

$(36 - 27) \div 2$ GEMDAS

$9 \div 2$ GEMDAS

4.5

(22) $52 + 8^2 - 3(4-2)^3$ GEMDAS

$52 + 8^2 - 3(2)^3$ GEMDAS

$52 + 64 - 3(8)$ GEMDAS

$52 + 64 - 24$ GEMDAS

$116 - 24$ GEMDAS

92

(25) $(5+t)^3$

$(4+8)^3$

12^3

1728

(26) $5^4 + t^2 + 5 \div 2$

$4^4 + 8^2 + 4 \div 2$

$256 + 64 + 2$

$320 + 2$

322

(27) $(5t)^2$

$(4 \cdot 8)^2$

$(32)^2$

1024

(33) $\dfrac{(3s)^3 t + t}{s}$

$\dfrac{(3 \cdot 4)^3 (8) + 8}{4} = \dfrac{(12)^3 (8) + 8}{4} = \dfrac{1728(8) + 8}{4} = \dfrac{13824 + 8}{4} = \dfrac{13832}{4} = 3458$

(37) $2[(8-4)^5 \div 8]$ GEMDAS — TAKE CARE OF THE INNERMOST GROUPING SYMBOLS FIRST

$2[4^5 \div 8]$ GEMDAS — NOW, DO THE ITEMS INSIDE THE GROUPING SYMBOL THAT REMAINS

$2[1024 \div 8]$ GEMDAS — YOU DO EXPONENTS BEFORE DIVISION

$2[128]$ GEMDAS — NOW, do division inside the grouping symbol

256

(42) $\dfrac{2[8+(67-2^6)^3]}{9}$ innermost grouping symbols, exponents

$\dfrac{2[8+(67-64)^3]}{9}$ innermost grouping symbols, subtraction

$\dfrac{2[8+3^3]}{9}$ grouping symbols, exponent

$\dfrac{2[8+27]}{9}$ grouping symbols, addition

$\dfrac{2[35]}{9}$ multiply

$\dfrac{70}{9}$ divide