

2.37)

$$(a) 4 - 8((-2)^2 - 4(-3))$$

$$4 - 8(4 - (-12))$$

$$4 - 8(4 + 12) = 4 - 8(16)$$

$$= 4 - 128$$

$$= -124$$

$$(b) (5-2)^2 + (2-5)^3$$

$$9 + (-(5-2))^3$$

$$9 + -(3)^3$$

$$9 - 27 = -18$$

$$(c) 5 \cdot 2^5 - (2 \cdot 3)^2$$

$$5 \cdot 2^5 - (2^2 \cdot 3^2)$$

$$2^2(5 \cdot 2^3 - (1) \cdot 3^2) = 4(40 - 9)$$

$$= 4(31) = 124$$

$$(d) 5 + (-6)^3 \div (2 \cdot 3^2)$$

$$5 + (-216) \div (18)$$

$$5 + \left(-\frac{2^3 \cdot 3^3}{2^1 \cdot 3^2}\right) = 5 + (-2^2 \cdot 3^1)$$

$$= 5 + (-12) = -7$$

2.38) $3^5 - 5^3$

$$3^5 = 243$$

$$5^3 = 125$$

$$\begin{array}{r} 3^5 \\ 243 \\ -125 \\ \hline 118 \end{array}$$

(118)

2.39)

$$-1^{2004} + (-1)^{2005} + 1^{2006} - 1^{2007}$$

$$-1 - 1 + 1 - 1$$

-2

2.40)

$$n^2 = 2^6$$

8

$$\begin{aligned} 2^{2 \cdot 3} &= (2^3)^2 \\ &= 8^2 \end{aligned}$$

2.41)

$$\begin{array}{r} 44 \\ \times 44 \\ \hline 176 \\ 176 \\ \hline 1436 \end{array}$$

$$44^2 = 1936$$

1936

2.42)

$$x^5 - 2x \quad \text{for } x=3?$$

$$3^5 - 2(3)$$

$$243 - 6 = 237$$

237

2.43)

$$x = -4, \quad -2x^3 - 3x^2$$

$$-2(-4)^3 - 3(-4)^2$$

$$-2(-64) - 3(16) = 128 - 48$$

$$= 80 \quad (80)$$

2.44) $1 \dots 10,000$

$1^2, \dots, 100^2$, del 1 al 99

99

2.45) $(1+2+3+\dots+6)^2 = 1^3 + 2^3 + \dots + n^3$ $n=8$

$21^2 = \dots$

6

$431 = 1 + 8 + 27 + 64 + 125 + 216$

2.46)

$N^3 = 4913$

17

17

$$\begin{array}{r} 4 \\ 17 \\ \times 17 \\ \hline 119 \\ 17 \\ \hline 289 \end{array}$$

$$\begin{array}{r} 66 \\ 289 \\ \times 17 \\ \hline 2023 \\ 289 \\ \hline 4913 \end{array}$$

2.47)

$(2^3)^3 = 2^{3^n}$

donde n es # de veces pecramadas.

$2^{3^n} > 10^9$

3 veces: $2^{27} = 2^9 \cdot 2^{18}$

es $2^{18} > 5^9$ NO

$(2)^{3^n} > 5^9 \cdot 2^9$

4 veces: $2^{81} = 2^9 \cdot 2^{72}$

$2^{72} > 5^9$?

$2^{9 \cdot 8} > 5^9$

4

2.40)

(a) 91

$$\begin{aligned}
 a^3 + b^3 &= 3^3 + 4^3 \\
 &= 27 + 64 \\
 &= 27 + 64
 \end{aligned}$$

$$1^3 = 1$$

$$2^3 = 8$$

$$3^3 = 27$$

$$4^3 = 64$$

$$5^3 = 125$$

$$6^3 = 216$$

$$(b) 6^3 + (-5)^3$$

$$216 - 125 = 91$$

$$216 + (-125)$$

2.49)

$$3^1 \dots 3^5$$

$$5 + 3^0 = 1$$

6

$$3^5 = 243$$

$$2.51) 3(3)^4 + 4(4)^3$$

$$3(81) + 4(64)$$

$$243 + 256$$

$$499$$

499

2.50)

$$10^5 < 695,000 < 10^6$$

5

2.52)

$$(a) 2^3 \cdot 4 \cdot 8 = 2^3 \cdot 2^2 \cdot 2^3 = 2^8$$

$$(b) \frac{1}{2}(2^{15}) = 2^{-1} \cdot 2^{15} = 2^{14}$$

$$(c) (2^5)^6 \div 4^3$$

$$2^{5 \cdot 6} \div (2^2)^3$$

$$2^{5 \cdot 6} \div 2^6$$

$$2^{30} \div 2^6 = 2^{24}$$

$$(d) 2^{20} - 2^{19} - 2^{18}$$

$$2^{18} (2^2 - 2^1 - 2^0)$$

$$2^{18} (4 - 2 - 1)$$

$$2^{18} (1)$$

$$2^{18}$$

$$2.53) 100^3 = (10^2)^3 = 10^6$$

$$2.54) \begin{array}{ll} (a) 8,000,000 & (d) 120 \\ (b) 243 & \\ (c) 180,000 & \end{array}$$

$$2.55) (a) 2^0 + 3^0 + (-4)^0 - (2+3-4)^0$$

$$1 + 1 + 1 - 1$$

$$\textcircled{2}$$

$$(b) (5^2 - 2^3 + 10^0 - 4^2)^{-2}$$

$$(25 - 8 + 1 - 16)^{-2}$$

$$(2)^{-2} = \frac{1}{2^2} = \frac{1}{4} \textcircled{\frac{1}{4}}$$

$$(e) (-1)^{-14} = (-1)^{14(-1)} = (1)^{(-1)} = \frac{1}{1} = \textcircled{1}$$

$$(f) \frac{1}{4^{-3}} = \frac{1}{4^{3(-1)}} = \frac{1}{64^{-1}} = \textcircled{64}$$

$$(c) \left(\frac{1}{2}\right)^{-3} = \left(\frac{1}{8}\right)^{-1}$$

$$= 8$$

$$\textcircled{8}$$

$$(d) (-2)^{-1} = \frac{1}{-2} = -\frac{1}{2}$$

$$\textcircled{-\frac{1}{2}}$$

$$2.56) (a) \frac{1}{9} = \frac{1}{3^2} = 3^{-2} \textcircled{3^{-2}}$$

$$(b) 3^{-4} \cdot 3^2 \div 3^3 = 3^{-4+2-3} = 3^{-5} \textcircled{3^{-5}}$$

$$(c) \left(\frac{1}{3^{-2}}\right)^{-3} \cdot 3^2 = (3^2)^{3(-1)} \cdot 3^2 = (3^6)^{-1} \cdot 3^2 = 3^{-6} \cdot 3^2 = \textcircled{3^{-4}}$$

$$(d) \quad 27^2 \div 3^{-3}$$

$$(3^3)^2 \div 3^{-3} = 3^6 \div 3^{-3}$$

$$= 3^{6 - (-3)}$$

$$= 3^9 \quad \textcircled{3^9}$$