

$$a) 4^{-4} \cdot 2^2 \cdot 16^2 = (2^2)^{-4} \cdot 2^2 \cdot (2^4)^2 = 2^{-8} \cdot 2^2 \cdot 2^8 = 2^2$$

$$b) \frac{\sqrt{3^4}}{\sqrt{3^8 \cdot 9}} = \frac{\sqrt{3^2 \cdot 3^2}}{\sqrt{3^2 \cdot 3^2 \cdot 3^2 \cdot 3^2 \cdot 3^2}} = \frac{\sqrt{3^2} \cdot \sqrt{3^2}}{3 \cdot 3 \cdot 3 \cdot 3 \cdot 3} = \frac{3 \cdot 3}{3^5} = \frac{3^2}{3^5} = 3^{-3}$$

$$c) \frac{\left((6^3)^5\right)^{-1}}{6^{-1}} = \frac{6^{-15}}{6^{-1}} = 6^{-14}$$

$$d) 2^3 \cdot 2^5 : 2^{-3} = 2^3 \cdot 2^5 \cdot 2^3 = 2^{11}$$

$$e) \sqrt{\sqrt{4^4} + \sqrt{2^6} + \sqrt{13^2}} = \sqrt{\sqrt{4^2 \cdot 4^2} + \sqrt{2^2 \cdot 2^2 \cdot 2^2} + 13} = \sqrt{\sqrt{4^2} \cdot \sqrt{4^2} + \sqrt{2^2} \cdot \sqrt{2^2} \cdot \sqrt{2^2} + 13} = \sqrt{4 \cdot 4 + 2 \cdot 2 \cdot 2 + 13} = \sqrt{37}$$

$$f) \frac{\sqrt{63}}{\sqrt{28}} = \frac{\sqrt{9 \cdot 7}}{\sqrt{4 \cdot 7}} = \frac{\sqrt{9} \cdot \sqrt{7}}{\sqrt{4} \cdot \sqrt{7}} = \frac{3}{2}$$

2. Calcule et trouve la fraction irréductible.

$$a) -\frac{7}{9} : \frac{28}{27} + \frac{1}{3} = -\frac{7}{9} \cdot \frac{27}{28} + \frac{1}{3} = -\frac{3}{4} + \frac{1}{3} = \frac{-9+4}{12} = -\frac{5}{12}$$

$$b) \frac{2}{5} - \frac{7}{5} : \frac{5}{7} = \frac{2}{5} - \frac{7}{5} \cdot \frac{7}{5} = \frac{2}{5} - \frac{49}{25} = \frac{10-49}{25} = -\frac{39}{25}$$

$$c) 3 \cdot \left(-\frac{4}{13}\right) - \frac{7}{26} = -\frac{12}{13} - \frac{7}{26} = \frac{-24-7}{26} = -\frac{31}{26}$$

$$d) \left(\frac{7}{8} - \frac{2}{3}\right) : \frac{12}{7} = \left(\frac{21-16}{24}\right) \cdot \frac{7}{12} = \frac{5}{24} \cdot \frac{7}{12} = \frac{35}{288}$$

3. Développe, effectue et réduis :

$$a) a^2bc + 2a^2b^2c - 2a^2bc = -a^2bc + 2a^2b^2c$$

$$b) -m^3n^2 - 2m^2n^3 + 3mn(mn^2) = -m^3n^2 - 2m^2n^3 + 3m^2n^3 \\ = -m^3n^2 + m^2n^3$$

$$c) 3s(-st + 5) = -3s^2t + 15s$$

$$d) (4z + 3)^2 = (4z + 3)(4z + 3) = 16z^2 + 12z + 12z + 9 = 16z^2 + 24z + 9$$

4. Développe, effectue et réduis :

a) $(-2ab^2) \cdot 6a^2b^5 = -12a^3b^7$

b) $y^2 (y - 3x^2y^4) = y^3 - 3x^2y^6$

c) $(a + b)^2 = (a + b)(a + b) = a^2 + 2ab + b^2$

d) $-2b^2 - 2b^2 \cdot 2 = -2b^2 - 4b^2 = -6b^2$

e) $(24xy^2 - 7x^2y) - (x^2y + 6xy - 11xy^2) = 24xy^2 - 7x^2y - x^2y - 6xy + 11xy^2$

$$= 35xy^2 - 8x^2y - 6xy$$

f) $\left((x^2)^{-1}\right)^3 = x^{-6}$