MODELO B

① $$\frac{1,2+1,\widehat{2}}{0,2\widehat{5}} = \frac{\frac{6}{5}+\frac{11}{9}}{\frac{23}{90}} = \frac{\frac{54+55}{45}}{\frac{23}{90}} = \frac{\frac{109}{45}}{\frac{23}{90}} = \frac{109\cdot 90}{45\cdot 23} = \boxed{\frac{218}{23}}$$

$1,2 = \frac{12}{10} = \frac{6}{5}$ $\quad 1,\widehat{2} = \frac{12-1}{9} = \frac{11}{9}$ $\quad 0,2\widehat{5} = \frac{25-2}{90} = \frac{23}{90}$

factoritamos — sacamos factores

② a) $$3\sqrt{5}+2\sqrt{125} = 3\sqrt{5}+2\cdot\sqrt{5^3} = 3\sqrt{5}+2\cdot 5\sqrt{5} = 3\sqrt{5}+10\sqrt{5} = \boxed{13\sqrt{5}}$$

b) $$\frac{\sqrt{\sqrt[3]{x^2}}}{\sqrt[9]{x^{12}}} = \frac{\sqrt[6]{x^2}}{\sqrt[9]{x^{12}}} = \frac{\sqrt[6:2]{x^{2:2}}}{\sqrt[9:3]{x^{12:3}}} = \frac{\sqrt[3]{x}}{\sqrt[3]{x^4}} = \sqrt[3]{\frac{\cancel{x}}{x^{\cancel{4}3}}} \Rightarrow$$

Simplificamos los radicales dividiendo índice y exponente por el m.c.d.

$$\Rightarrow \sqrt[3]{\frac{x}{x^4}} = \sqrt[3]{\frac{1}{x^3}} = \frac{1}{x}\sqrt[3]{1} = \boxed{\frac{1}{x}}$$

sacamos factores

c) $$\frac{\left(\sqrt[9]{a^2}\right)^3}{\sqrt[12]{a^4}} = \frac{\sqrt[9]{a^{6}}}{\sqrt[12]{a^4}} = \frac{\sqrt[9:3]{a^{6:3}}}{\sqrt[12:4]{a^{4:4}}} = \frac{\sqrt[3]{a^2}}{\sqrt[3]{a}} = \sqrt[3]{\frac{a^{\cancel{2}}}{\cancel{a}}} \Rightarrow$$

$2\cdot 3$

Simplificamos

$$\Rightarrow \boxed{\sqrt[3]{a} = a^{1/3}}$$

③ $$\left[\left(\frac{2}{3}-\frac{1}{9}\right)+13\cdot\left(\frac{2}{3}-1\right)^2\right] : \left(\frac{1}{3}-1\right) = \left[\left(\frac{6-1}{9}\right)+13\cdot\left(\frac{2}{3}-\frac{3}{3}\right)^2\right] : \frac{1-3}{3} \Rightarrow$$

base negativa, exponente par

$$\Rightarrow \left[\left(\frac{5}{9}\right)+13\cdot\left(-\frac{1}{3}\right)^2\right] : \left(\frac{-2}{3}\right) = \left[\frac{5}{9}+13\cdot\frac{1}{9}\right] : \left(\frac{-2}{3}\right) = \left[\frac{5}{9}+\frac{13}{9}\right] : \left(\frac{-2}{3}\right) \Rightarrow$$

$$\frac{18}{9} : \left(\frac{-2}{3}\right) = 2 : \left(\frac{-2}{3}\right) = \frac{6}{-2} = \boxed{-3}$$

④ $\dfrac{8^{-3}\cdot 4^{-1}\cdot 3^{2}}{7^{-2}\cdot 4^{-5}\cdot 6} = \dfrac{(2^3)^{-3}\cdot(2^2)^{-1}\cdot 3^2}{7^{-2}\cdot(2^2)^{-5}\cdot 2.3} = \dfrac{2^{-9}\cdot 2^{-2}\cdot 3^2}{7^{-2}\cdot 2^{-10}\cdot 2.3} = \dfrac{2^{-11}\cdot 3^2}{7^{-2}\cdot 2^{-9}\cdot 3} \Rightarrow$

$\Rightarrow \dfrac{2^{-11-(-9)}\cdot 3^{2-1}}{7^{-2}} = \dfrac{2^{-2}\cdot 3}{7^{-2}} = \dfrac{3\cdot 7^2}{2^2} = \boxed{3\cdot\left(\dfrac{7}{2}\right)^2}$

⑤ $N = 13.345$

Edades → inversa

$5 \rightarrow \dfrac{1}{5} \Rightarrow \dfrac{38.128,67}{5} = \boxed{7.625,71}$

$12 \rightarrow \dfrac{1}{12} \Rightarrow \dfrac{38.128,67}{12} = \boxed{3.177,38}$

$15 \rightarrow \dfrac{1}{15} \Rightarrow \dfrac{38.128,67}{15} = \boxed{2541,90}$

Razón $= \dfrac{13.345}{\frac{1}{5}+\frac{1}{12}+\frac{1}{15}} = \dfrac{13.345}{\frac{12+5+4}{60}} \Rightarrow \dfrac{13.345}{\frac{21}{60}} = 38.128,67$

La suma no da 13345 exacto por el redondeo de los decimales

⑥ Como no sabemos el precio original, partimos del 100% de una cantidad cualquiera.

$C_F = 100\% \cdot (1+0,15)\cdot(1+0,16) = 100\% \cdot 1,334 = 133,4\%$

$\text{Var}\,\% = \dfrac{133,4\% - 100\%}{100\%} = \boxed{33,4\%}$

⑦ $a_2 = 2 \quad a_4 = \dfrac{1}{2} \Rightarrow S_n = \dfrac{a_1(r^n-1)}{(r-1)} \qquad a_p = a_q\cdot r^{p-q} \quad p>q$

Necesitamos saber r y a_1

$a_4 = a_2\cdot r^{4-2} \qquad \dfrac{1}{2} = 2\cdot r^2 \Rightarrow \dfrac{\frac{1}{2}}{2} = r^2 \Rightarrow \dfrac{1}{4} = r^2 \Rightarrow r = \sqrt{\dfrac{1}{4}} = \pm\dfrac{1}{2}$

$a_2 = a_1\cdot r^{2-1} \Rightarrow 2 = a_1\cdot\left(\pm\dfrac{1}{2}\right) \Rightarrow a_1 = \pm 4.$

- $S_6 = \dfrac{4\cdot\left(\left(\frac{1}{2}\right)^6-1\right)}{\left(\frac{1}{2}-1\right)} = \dfrac{4\cdot\left(\frac{1}{64}-1\right)}{\left(\frac{-1}{2}\right)} = \dfrac{4\cdot\frac{-63}{64}}{-\frac{1}{2}} = \dfrac{-\frac{63}{16}}{-\frac{1}{2}} = \boxed{\dfrac{63}{8}}$

- $S_6 = \dfrac{(-4)\left(\left(-\frac{1}{2}\right)^6-1\right)}{\left(\frac{-1}{2}-1\right)} = \dfrac{(-4)\left(\frac{1}{64}-1\right)}{\frac{-3}{2}} = \dfrac{\frac{(-4)\cdot(-63)}{64}}{\frac{-3}{2}} = \dfrac{\frac{63}{16}}{\frac{-3}{2}} = \boxed{-\dfrac{21}{8}}$