1. a) $t^4\left(\frac{t^3}{2}-\frac{4}{t}\right)+2t^7 = \frac{t^7}{2}-\frac{4t^4}{t}+2t^7 = \frac{t^7}{2}+\frac{4t^7}{2}-4t^3 = \underline{\underline{\frac{5t^7}{2}-4t^3}}$

b) $\frac{-10a^8b^5}{2ab^3}\left(\frac{3b}{2a^2}\right)^2 a = -5ab^2\,\frac{9b^2}{4a^4}\,a = \frac{-45a^2b^4}{4a^4} = \underline{\underline{-\frac{45b^4}{4a^2}}}$

c) $\frac{2}{3}\left(2x-\frac{y}{2}\right)-\frac{3}{4}(6-x)-\frac{x+3y}{3} = \frac{4x}{3}-\frac{y}{3}-\frac{9}{2}+\frac{3x}{4}-\frac{x}{3}-y =$

$= \frac{16x}{12}+\frac{9x}{12}-\frac{4x}{12}-\frac{y}{3}-\frac{3y}{3}-\frac{9}{2} = \frac{21x}{12}-\frac{4y}{3}-\frac{9}{2} = \underline{\underline{\frac{7x}{4}-\frac{4y}{3}-\frac{9}{2}}}$

2. a) $6a^2t^5-2a^3t^4+10a^4t^3 = \underline{\underline{2a^2t^3(3t^2-at+5a^2)}}$

b) $18-2y^2 = 2(9-y^2) = \underline{\underline{2(3-y)(3+y)}}$

c) $x(a+b)-2(a+b)+y(a+b) = \underline{\underline{(a+b)(x+y-2)}}$

d) $8x^3+24x^2+18x = 2x(4x^2+12x+9) = \underline{\underline{2x(2x+3)^2}}$

3. a) $2(2x+1)^2+4 = (8x-2)(x+1)$

$2(4x^2+4x+1)+4 = 8x^2+8x-2x-2$

$8x^2+8x+6 = 8x^2+6x-2$

$2x = -8$

$\underline{\underline{x=-4}}$

b) $x = \frac{1}{2}\left(x-\frac{2}{3}\right)-\frac{2x+2}{3}$

$x = \frac{x}{2}-\frac{1}{3}-\frac{2x}{3}-\frac{2}{3}$

$x-\frac{x}{2}+\frac{2x}{3} = -1$

$\frac{6x}{6}-\frac{3x}{6}+\frac{4x}{6} = -1$

$7x = -6$

$\underline{\underline{x=-\frac{6}{7}}}$

(c) $ax+a = bx+1$

$ax-bx = 1-a$

$x(a-b) = 1-a$

$\underline{\underline{x=\frac{1-a}{a-b}}}$

4. x = prix d'une balle jaune

y = prix d'une balle blanche

$$\begin{cases} 12x+8y = 50{,}4 & ① \\ y = x-0{,}2 & ② \end{cases}$$

② → ① : $12x+8(x-0{,}2) = 50{,}4$

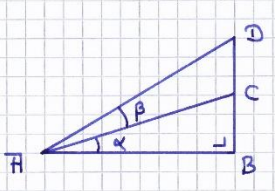
$12x+8x-1{,}6 = 50{,}4$

$20x = 52$

$x = 2{,}6$ et $y = 2{,}4$

Une balle jaune coûte 2,60 francs et une balle blanche 2,40 francs.

5.



Donn : $AC = 14\text{cm}$, $CD = 6\text{cm}$, $\alpha = 22°$

Cherché : AD et β

Δ_{ABC} : $\sin\alpha = \frac{BC}{AC} \Rightarrow BC = AC\cdot\sin\alpha = 14\cdot\sin 22° = 5{,}24\text{ cm}$

Δ_{ABC} : $\cos\alpha = \frac{AB}{AC} \Rightarrow AB = AC\cdot\cos\alpha = 14\cdot\cos 22° = 12{,}98\text{ cm}$

$BD = BC+CD = 5{,}24+6 = 11{,}24\text{ cm}$

Δ_{ABD} : $\tan(\alpha+\beta) = \frac{BD}{AB} = \frac{11{,}24}{12{,}98} \Rightarrow \alpha+\beta = 40{,}90°$

$\beta = 40{,}90°-\alpha$

$= 40{,}90°-22$

$= 18{,}90°$

Δ_{ABD} : $\sin(\alpha+\beta) = \frac{BD}{AD} \Rightarrow AD = \frac{BD}{\sin(\alpha+\beta)} = \frac{11{,}24}{\sin 40{,}90°} = 17{,}17\text{ cm}$

$\underline{\underline{AD = 17{,}17\text{ cm}}}$ et $\underline{\underline{\beta = 18{,}90°}}$