① a) V c) F

b) F d) V

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② a) $\sqrt[3]{64} - \sqrt{81} + \sqrt[4]{2^8}$

$= \sqrt[3]{4^3} - \sqrt{9^2} + \sqrt[4]{(2^2)^4}$

$= 4 - 9 + 2^2 = -5 + 4 = -1$

b) $\frac{\operatorname{sen} 30^\circ}{\cos 45^\circ} + \frac{1}{\cos 45^\circ \times \operatorname{tg} 45^\circ}$

$= \frac{1/2}{\sqrt{2}/2} + \frac{1}{\frac{\sqrt{2}}{2} \times 1}$

$= \frac{1}{2} \times \frac{2}{\sqrt{2}} + 1 \times \frac{2}{\sqrt{2}}$

$= \frac{1}{\sqrt{2}} + \frac{2}{\sqrt{2}} = \frac{3}{\sqrt{2}} = \frac{3\sqrt{2}}{2}$

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③ $P(x) = (m+4)x^3 + 2x^2 + x + 1$

Para ser do 2.º grau, @ $m+4=0$

$\Rightarrow m+4=0 \Rightarrow m = 0-4$

$\boxed{m = -4}$

④ $(x^3 - 4x^2 + x + 6) \cdot (x + 3)$

$= x^4 + 3x^3 - 4x^3 - 12x^2 + x^2 + 3x + 6x + 18$

$= x^4 - x^3 - 11x^2 + 8x + 18$

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⑤ $2 \operatorname{sen} x - 1 = 0 \qquad x \in [0; \pi]$

$\Rightarrow 2 \operatorname{sen} x = 0 + 1$

$\Rightarrow \frac{2 \operatorname{sen} x}{2} = \frac{1}{2}$

$\Rightarrow \operatorname{sen} x = \frac{1}{2} \Leftrightarrow \operatorname{sen} x = \operatorname{sen} \frac{\pi}{6}$

$\Rightarrow x = \frac{\pi}{6}$

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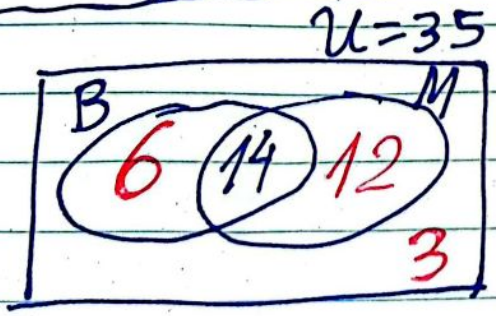
⑥ a)



b) 3

c) 32

d) $\frac{20}{35} \cdot 100\%$

$= 57{,}14\%$

(7) a) $A = 6$ $\quad C = \frac{3}{20} \times 100\% = 15\%$

$B = 7$ $\quad D = \frac{7}{20} \times 100\% = 35\%$

b) $\text{média} = \frac{3 \times 154 + 6 \times 160 + 2 \times 165 + 7 \times 168 + 2 \times 175}{20}$

$\text{média} = \frac{462 + 960 + 330 + 1176 + 350}{20}$

$\text{média} = \frac{3278}{20} = 163{,}9 \approx 164$

c) Moda = 168 → que é o valor mais repetido

(8) a) o sinal de a é negativo porque a função é decrescente

b) o valor de b é a ordenada na origem : $b = 1$

c)

x	$]-\infty; 1[$	1	$]1; +\infty[$
Sinal	+	0	−

8 d)

$y = ax + b$

$0 = a(1) + 1$

$0 = a + 1$

$\Rightarrow \boxed{a = -1}$

$f(x) = ax + b$

$f(x) = -1 \cdot x + 1$

$\boxed{f(x) = -x + 1}$