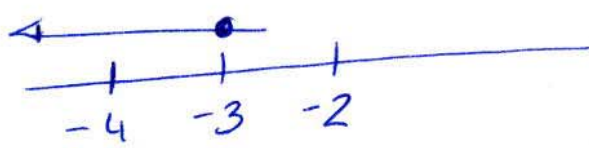


① a) $A = \{x \in \mathbb{R} \mid -1 < x \leq 4\}$ $(-1, 4]$ 1/3

b) $B = \{x \in \mathbb{R} \mid -4 < x < 3\}$ $(-4, 3)$



c) $(-\infty, -3]$



d) $(-\infty, -2)$ $D = \{x \in \mathbb{R} \mid x < -2\}$

②

$$\frac{\sqrt{a^3 \sqrt[5]{b^7 b^4}}}{\sqrt[6]{b^5 \cdot a^4 \sqrt{a^3 \cdot b}}} = \frac{a^{\frac{3}{2}} \cdot b^{\frac{7}{10}} b^{\frac{4}{10}}}{b^{\frac{5}{6}} a^{\frac{4}{6}} a^{\frac{3}{12}} b^{\frac{1}{12}}} = \frac{a^{\frac{3}{2}} b^{\frac{7}{10} + \frac{4}{10}}}{b^{\frac{5}{6} + \frac{1}{12}} a^{\frac{4}{6} + \frac{3}{12}}} =$$

$$= \frac{a^{\frac{3}{2}} b^{\frac{11}{10}}}{b^{\frac{10+1}{12}} a^{\frac{8+3}{12}}} = \frac{a^{\frac{3}{2}} b^{\frac{11}{10}}}{b^{\frac{11}{12}} a^{\frac{11}{12}}} = a^{\frac{3}{2} - \frac{11}{12}} b^{\frac{11}{10} - \frac{11}{12}} =$$

$$= a^{\frac{18-11}{12}} b^{\frac{132-110}{120}} = a^{\frac{7}{12}} b^{\frac{22}{120}} = \underline{\underline{a^{\frac{7}{12}} b^{\frac{11}{60}}}}$$

③ a) $\sqrt{45} + 2\sqrt{20} - \sqrt{80} = \sqrt{3^2 \cdot 5} + 2\sqrt{5 \cdot 2^2} - \sqrt{2^4 \cdot 5} =$
 $= 3\sqrt{5} + 2 \cdot 2\sqrt{5} - 2^2\sqrt{5} = 3\sqrt{5} + 4\sqrt{5} - 4\sqrt{5} = \underline{\underline{3\sqrt{5}}}$

b) $\sqrt{8} + 4\sqrt{18} - \sqrt{50} = \sqrt{2^3} + 4\sqrt{2 \cdot 3^2} - \sqrt{2 \cdot 5^2} =$
 $= 2\sqrt{2} + 4 \cdot 3\sqrt{2} - 5\sqrt{2} = 2\sqrt{2} + 12\sqrt{2} - 5\sqrt{2} = \underline{\underline{9\sqrt{2}}}$

$$\textcircled{4} a) \sqrt[5]{3} \cdot \sqrt[5]{4} \div \sqrt[5]{2} = \sqrt[5]{12} \div \sqrt[5]{2} = \sqrt[5]{6} \quad \frac{2}{3}$$

$$b) \sqrt[3]{729} - \sqrt{9} = \sqrt[6]{729} - \sqrt{9} = \sqrt[6]{3^6} - \sqrt{3^2} =$$

$$= 3 - 3 = 0$$

729		3
243		3
81		3
27		3
9		3
3		3
1		

$$\textcircled{5} a) \sqrt{129600} = \sqrt{2^6 \cdot 3^4 \cdot 5^2} = 2^3 \cdot 3^2 \cdot 5 = \underline{\underline{360}}$$

129600		2
64800		2
32400		2
16200		2
8100		2
4050		2
2025		3
675		3
225		3
75		3
25		5
5		5
1		

$$b) \sqrt[5]{537824} = \sqrt[5]{2^5 \cdot 7^5} = 2 \cdot 7 = \underline{\underline{14}}$$

537824		2
268912		2
134456		2
67228		2
33614		2
16807		7
2401		7
343		7
49		7
7		7
1		

$$c) \sqrt[6]{15625} = \sqrt[6]{5^6} = \underline{\underline{5}}$$

15625		5
3125		5
625		5
125		5
25		5
5		5
1		

$$\textcircled{6} \quad a) 3^{-2} \cdot 3^5 = 3^3$$

$$b) (7^4)^{-3} = 7^{-12} = \frac{1}{7^{12}}$$

$$c) \frac{2^{-1} \cdot (2^5)^{-3} \cdot 2}{2^{-7}} = \frac{\cancel{2}^{-1} \cdot \cancel{2}^{-15} \cdot \cancel{2}}{2^{-7}} = 2^{-8} = \frac{1}{2^8}$$

$$d) \left(\frac{1}{\sqrt{2}}\right)^{-4} = (\sqrt{2})^4 = 2^2$$

$$e) 5\sqrt{5} = 5 \cdot 5^{\frac{1}{2}} = 5^{1+\frac{1}{2}} = 5^{\frac{2+1}{2}} = 5^{\frac{3}{2}}$$

$$f) 2^2 \cdot \sqrt[3]{2} = 2^2 \cdot 2^{\frac{1}{3}} = 2^{\frac{6+1}{3}} = 2^{\frac{7}{3}}$$

$$\textcircled{7} \quad a) X^{-2} = \frac{1}{4} \Rightarrow \frac{1}{X^2} = \frac{1}{4} \quad X^2 = 4 \quad X = \pm\sqrt{4}$$

$$b) X^4 = 16 \cdot 9^2 = 2^4 \cdot (3^2)^2 = 2^4 \cdot 3^4$$

$$X = \sqrt[4]{2^4 \cdot 3^4} = 2 \cdot 3 = 6$$

