(1)
$$\frac{\sqrt[3]{\sqrt{d^3}}\cdot\sqrt{a^3\cdot b^3}\cdot\sqrt[3]{\sqrt{b}}}{\sqrt{b^3\cdot a^2}\cdot\sqrt[5]{d^4}}=\frac{d^{\frac{3}{6}}\cdot a^{\frac{3}{2}}\cdot b^{\frac{3}{2}}\cdot b^{\frac{1}{6}}}{b^{\frac{3}{2}}\cdot a^{\frac{2}{2}}\cdot d^{4/5}}=$$

$$=d^{\frac{3}{6}-\frac{4}{5}}\cdot a^{\frac{3}{2}-\frac{2}{2}}\cdot b^{\cancel{\frac{3}{2}}+\frac{1}{6}-\cancel{\frac{3}{2}}}=$$

$$=d^{\frac{15-24}{30}}\cdot a^{\frac{1}{2}}\cdot b^{\frac{1}{6}}=d^{\frac{-9}{30}}\cdot a^{\frac{1}{2}}\cdot b^{\frac{1}{6}}=$$

$$\underline{\underline{=d^{-\frac{3}{10}}\cdot a^{\frac{1}{2}}\cdot b^{\frac{1}{6}}}}$$

(2)
$$\frac{3}{-3+\sqrt{2}}=\frac{3}{-3+\sqrt{2}}\cdot\frac{(-3-\sqrt{2})}{(-3-\sqrt{2})}=\frac{-9-3\sqrt{2}}{(-3)^2-(\sqrt{2})^2}$$

$$=\frac{-9-3\sqrt{2}}{9-2}=\frac{-9-3\sqrt{2}}{7}$$

(3)
$$2'0\overline{3}+3'\overline{2}-0'7=\frac{183}{90}+\frac{29}{9}-\frac{7}{10}=$$

$$2'0\overline{3}=\frac{203-20}{90}=\frac{183}{90}\ //\ =\frac{183+290-63}{90}=$$

$$3'\overline{2}=\frac{32-3}{9}=\frac{29}{9}\qquad=\frac{410}{90}=\frac{41}{9}=\underline{\underline{4'\overline{5}}}$$

$$0'7=\frac{7}{10}$$

(4) $2x^4+3x^3+mx+20 \div x+5$

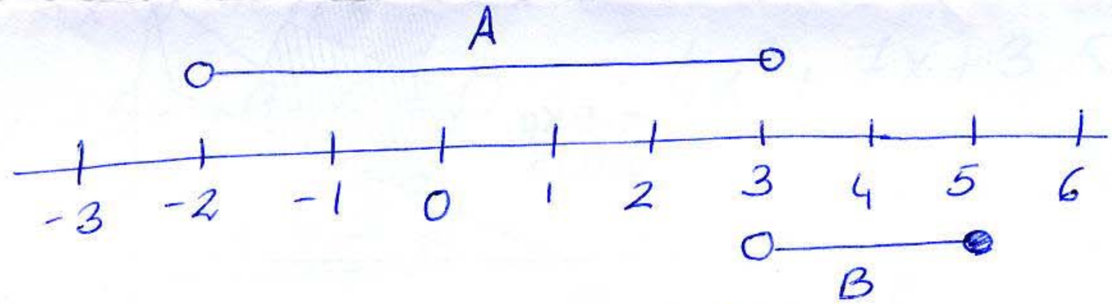
$$\begin{array}{r|rrrr} & 2 & 3 & m & 20 \\ & & -10 & +35 & -20 \\ -5 & & & & \\ \hline & 2 & -7 & +4 & \boxed{0} \end{array}$$

$m+35=4 \quad m=4-35 \quad \boxed{m=-31}$

(5) $A, B, A \cup B, A \cap B$

$A=\{x \in \mathbb{R} \mid -2<x<3\} \; (-2,3)$

$B=\{x \in \mathbb{R} \mid 3<x \leq 5\} \; (3,5]$



$A \cup B = (-2,3) \cup (3,5]$

$A \cap B = \emptyset$

(6) $\dfrac{x}{2x-1}+\dfrac{2(x^2-1)}{2x^2-x}=1+\dfrac{2}{x}$

$$\left.\begin{array}{l} 2x-1=2x-1 \\ 2x^2-x=x\cdot(2x-1) \\ x=x \end{array}\right\} \; m.c.m = x(2x-1)=2x^2-x$$

$$\frac{x^2+2x^2-2}{\cancel{2x^2-x}} = \frac{2x^2-x+2(2x-1)}{\cancel{2x^2-x}}$$

$$x^2+2x^2-2 = 2x^2-x+4x-2$$

$$x^2 \cancel{+2x^2} \cancel{-2x^2} + x - 4x \cancel{-2} \cancel{+2} = 0$$

$$x^2-3x=0 \quad \begin{cases} \underline{x=0} \\ x-3=0 \quad \underline{x=3} \end{cases}$$

(7) a).- $\sqrt{5x+6} - 3 = 2x$

$$\sqrt{5x+6} = 2x+3 \rightarrow (\sqrt{5x+6})^2 = (2x+3)^2$$

$$5x+6 = 4x^2+9+12x$$

$$4x^2+12x-5x+9-6=0 \qquad 4x^2+7x+3=0$$

$$x = \frac{-7 \pm \sqrt{49-4\cdot4\cdot3}}{2\cdot4} = \frac{-7\pm\sqrt{1}}{8} = \frac{-7\pm1}{8}$$

$$x_1 = \frac{-7+1}{8} = \frac{-6}{8} = -\frac{3}{4} \qquad x_2 = \frac{-7-1}{8} = \frac{-8}{8} = -1$$

b).- $4x^4-17x^2+4=0 \xrightarrow[z^2=x^4]{z=x^2} 4z^4-17z+4=0$

$$z = \frac{17\pm\sqrt{17^2-4\cdot4\cdot4}}{2\cdot4} = \frac{17\pm\sqrt{225}}{8} = \frac{17\pm15}{8}$$

$$z_1 = \frac{17+15}{8} = 4 \qquad z_2 = \frac{17-15}{8} = \frac{2}{8} = \frac{1}{4}$$

$x = \pm\sqrt{z}$

$x_1 = +2$

$x_2 = -2$

$x_3 = +\frac{1}{2}$

$x_4 = -\frac{1}{2}$