I. Kiến thức cần nhớ:

Nếu $x, y \in Q$ thì $x = \frac{a}{b}$ và $y = \frac{c}{d}$ với $a, b, c, d \in Z$ và $b, d \neq 0$

$$x.y = \frac{a}{b}.\frac{c}{d} = \frac{a.c}{b.d}$$

$$x : y = x.\frac{1}{y} = \frac{a}{b}.\frac{d}{c} = \frac{a.d}{b.c} \text{ với } y \neq 0$$

II. Bài tập:

Bài 1: Tính:

a) $(-18).\frac{-5}{27}$; b) $\left(-2\frac{1}{3}\right).\left(\frac{-6}{4}\right) =$; c) $\left(-\frac{-5}{9}\right) : \frac{15}{17}$;

d) $\left(-2\frac{3}{5}\right) : \left(\frac{-26}{25}\right)$ e) $\frac{-5}{13}.\frac{26}{7}.\frac{-21}{25}.\frac{15}{16}$ f) $\frac{-2}{3} : \frac{-3}{4} : \frac{-4}{5} : \frac{7}{9}$

Bài 2: Tính theo cách hợp lý:

a) $F = \left(\frac{-5}{9}\right).\frac{3}{11} + \left(\frac{-13}{18}\right).\frac{3}{11}$ b) $B = \frac{-10}{11}.\frac{8}{9} + \frac{7}{18}.\frac{10}{11}$

c) $\left(\frac{-5}{6} + \frac{2}{5}\right) : \frac{3}{8} + \left(\frac{4}{5} - \frac{11}{30}\right) : \frac{3}{8}$; d) $\left[\left(\frac{-7}{8}\right) - \frac{13}{16}\right] : \frac{24}{13}$

Bài 3: Tìm x:

a) $x : \frac{3}{7} = 2\frac{1}{3}$; b) $\frac{-12}{13}x = \frac{-5}{26}$; c) $\frac{1}{14} : x = \frac{-3}{35}$; d) $\frac{3}{7}x - \frac{2}{3}x = \frac{10}{21}$ e) $2\frac{1}{5}x - \frac{1}{3}x = \frac{-56}{45}$

f) $\frac{2}{3} + \frac{1}{3} : x = \frac{4}{5}$; g) $x\left(x - \frac{3}{2}\right) = 0$; h) $\left(x + \frac{4}{7}\right)\left(x - \frac{8}{9}\right) = 0$; k) $(3\,\mathrm{x} - 2)\left(2\,\mathrm{x} - \frac{2}{3}\right) = 0$

Bài 4: Cho hai biểu thức:

$$A = \left(1 - \frac{1}{2}\right)\left(1 - \frac{1}{3}\right)\left(1 - \frac{1}{4}\right)...\left(1 - \frac{1}{19}\right)\left(1 - \frac{1}{20}\right)$$

$$B = \left(1 - \frac{1}{4}\right)\left(1 - \frac{1}{9}\right)\left(1 - \frac{1}{16}\right)...\left(1 - \frac{1}{81}\right)\left(1 - \frac{1}{100}\right)$$

a) So sánh A với $\frac{1}{21}$; b) So sánh B với $\frac{11}{21}$

Bài 5: Tính:

a) $A=\left(\frac{1}{2}-1\right)\left(\frac{1}{3}-1\right)....\left(\frac{1}{2002}-1\right)\left(\frac{1}{2003}-1\right)$

b) $B=\left(-1\frac{1}{2}\right)\left(-1\frac{1}{3}\right)....\left(-1\frac{1}{2003}\right)\left(-1\frac{1}{2004}\right)$

c) $C=\left(1-\frac{1}{2^2}\right)\left(1-\frac{1}{3^2}\right)\left(1-\frac{1}{4^2}\right)...\left(1-\frac{1}{n^2}\right)$ $(n\in\mathbb{N},\ n\geq 2)$

Bài 6: Cho $A=x\left(x-\frac{1}{2}\right)$. Tìm x để:

a) $A=0$ b) $A>0$ c) $A<0$.

Bài 7. Tìm giá trị nhỏ nhất của biểu thức:

a) $A=\left(x-\frac{1}{3}\right)^2+15$; b) $B=\left(x-\frac{1}{4}\right)^4+(y-3)^2+9$.

Bài 8. Tìm giá trị lớn nhất của biểu thức:

a) $A=-\left(x+\frac{18}{1203}\right)^2-\frac{183}{121}$; b) $B=\frac{4}{\left(x+\frac{1}{3}\right)^2+5}$.

BTVN:

Bài 1: Thực hiện phép tính (hợp lí nếu có thể):

a) $\frac{12}{25}.\frac{23}{7}-\frac{12}{25}.\frac{12}{7}$ b) $13\frac{2}{7}:\left(\frac{-8}{9}\right)+2\frac{5}{7}:\left(\frac{-8}{9}\right)$ c) $\left(\frac{-6}{11}\right).\frac{7}{10}.\left(\frac{11}{-6}\right).(-20)$

g) $21-3\frac{3}{4}:\left(\frac{3}{8}-\frac{1}{6}\right)$ m) $\left(\frac{-3}{4}+\frac{2}{5}\right):\frac{3}{7}+\left(\frac{3}{5}+\frac{-1}{4}\right):\frac{3}{7}$ i) $\frac{1}{2011}+\frac{2012.2010}{2011}-2012$

Bài 2: Tìm x, biết:

a) $1\frac{1}{2}x+\frac{-4}{5}=4$ b) $\frac{2}{3}x+\frac{-1}{2}x=\frac{-5}{12}$ c) $(2x-1)\left(x+\frac{2}{3}\right)=0$

d) $\left(4\frac{2}{3}-2x\right).2\frac{1}{4}=1\frac{1}{2}$ e) $\frac{3}{5}+\frac{4}{9}:x=\frac{2}{3}$ f) $\frac{7}{35}:\left(x-\frac{1}{3}\right)=-\frac{2}{25}$

l) $\frac{x+4}{2011}+\frac{x+3}{2012}+\frac{x+2}{2013}+\frac{x+1}{2014}$ m) $(x+1)(x+5)>0$