Mathematics Marathon 04/08/2023 Tasks

Задачи № 1, 2, 5, 12, 15.

1. $\frac{1}{2} + \frac{2}{3} = \frac{3+4}{6} = \frac{7}{6} = 1\frac{1}{6}$

2. $\frac{3}{2} + \frac{1}{2} = \frac{4}{2} = 2$

1. $\frac{1}{2} + \frac{1}{3} = \frac{3+2}{6} = \frac{5}{6}$

5. $\frac{3}{8} - \frac{1}{4} = \frac{3}{8} - \frac{2}{8} = \frac{1}{8}$

12. $\frac{5}{3} \cdot \frac{15}{10} = \frac{5}{5} \cdot \frac{3}{2} = \frac{15}{6} = \frac{5}{2}$

15. $\frac{1}{2} : \frac{1}{2} = \frac{1}{2} \cdot \frac{2}{1} = \frac{2}{2} = 1$

Задачи № 8, 9, 10

8. $\frac{5^2 - 1}{18} \cdot \frac{10}{4} = \frac{25-1}{18} \cdot \frac{10}{4} = \frac{24}{18} \cdot \frac{10}{4} =$

$= \frac{4}{3} \cdot \frac{5}{2} = \frac{20}{6} = \frac{10}{3}$

9. $\frac{3}{8} \cdot \frac{24}{5} \cdot \frac{10}{27} = \frac{720}{1080} = \frac{72}{108} = \frac{24}{36} = \frac{4}{6} =$

$= \frac{2}{3}$

10. $\frac{3}{5} \cdot \frac{5}{7} \cdot \frac{7}{9} - \frac{2}{4} \cdot \frac{4}{6} \cdot \frac{6}{8} = \frac{15}{35} \cdot \frac{7}{9} - \frac{1}{2} \cdot \frac{2}{3} \cdot \frac{3}{4} =$

Arithmetic roots

1. $\sqrt{1} = 1$

2. $\sqrt{4} = 2$

3. $\sqrt{\frac{1}{4}} = \frac{1}{2}$

4. $\sqrt{200x^5} = 10^2 \cdot 2 \cdot \sqrt{10x^2 \cdot 2x^3} =$

$= \sqrt{10x^4 \cdot 2x} = 10x^2 \sqrt{2x}$

5. $\sqrt{12xz} = 2\sqrt{3xz}$

6. $\sqrt{\frac{3}{8}} = \sqrt{\frac{3}{2}} = \frac{\sqrt{3}}{\sqrt{8}} = \frac{\sqrt{3}}{\sqrt{2^2 \cdot 2}} = \frac{\sqrt{3}}{2\sqrt{2}}$

7. $\frac{\sqrt{3}}{2\sqrt{2}} = \frac{\sqrt{6}}{2 \cdot \sqrt{2}} = \frac{\sqrt{6}}{4} = \frac{\sqrt{3} \cdot \sqrt{2}}{2^2} = \frac{\sqrt{3}}{2^{\frac{3}{2}}}$

7. $\sqrt{0{,}2} = \sqrt{\frac{2}{10}} = \sqrt{\frac{1}{5}} = \frac{\sqrt{5}}{5}$

8. $\sqrt{\frac{3}{10}} = \frac{\sqrt{3}}{\sqrt{10}} = \frac{\sqrt{30}}{10} \quad (\cdot \sqrt{10})$

9. $\frac{3}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{3\sqrt{2}}{\sqrt{2} \cdot 2} = \frac{3\sqrt{2}}{2}$

10. $\sqrt{648} = \sqrt{324 \cdot 2} = \sqrt{162 \cdot 2} =$

$= \sqrt{81 \cdot 2 \cdot 2 \cdot 2} = \sqrt{3 \cdot 27 \cdot 2 \cdot 2 \cdot 2} =$

$= \sqrt{3 \cdot 3 \cdot 9 \cdot 2 \cdot 2 \cdot 2} = \sqrt{3 \cdot 3 \cdot 3 \cdot 3 \cdot 2 \cdot 2 \cdot 2} = \frac{(3 \cdot 3)(2)}{9} \cdot 2 \sqrt{2} = 18\sqrt{2}$