

BỒI DƯỠNG NĂNG LỰC TOÁN
GIÁO VIÊN: NGUYỄN THÀNH LONG
ĐÁP ÁN BÀI TẬP TỰ LUYỆN
CÁC PHÉP TOÁN VỀ PHÂN SỐ (TIẾP)

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Bài 1: Tính nhanh

$$\begin{aligned} \text{a)} & \frac{45 \times 16 - 17}{45 \times 15 + 28} \\ \text{b)} & \frac{1946 \times 131 + 1000}{132 \times 1946 - 946} \end{aligned}$$

Bài giải

$$\begin{aligned} \text{a)} & \frac{45 \times 16 - 17}{45 \times 15 + 28} \\ &= \frac{45 \times (15 + 1) - 17}{45 \times 15 + 28} \\ &= \frac{45 \times 15 + 45 - 17}{45 \times 15 + 28} \\ &= \frac{45 \times 15 + 28}{45 \times 15 + 28} \\ &= 1 \end{aligned}$$

$$\begin{aligned} \text{b)} & \frac{1946 \times 131 + 1000}{132 \times 1946 - 946} \\ &= \frac{1946 \times 131 + 1000}{1946 \times (131 + 1) - 946} \\ &= \frac{1946 \times 131 + 1000}{1946 \times 131 + 1946 - 946} \\ &= \frac{1946 \times 131 + 1000}{1946 \times 131 + 1000} \\ &= 1 \end{aligned}$$

Bài 2: Tính giá trị biểu thức:

$$B = \frac{3}{4 \times 7} + \frac{3}{7 \times 10} + \frac{3}{10 \times 13} + \dots + \frac{3}{73 \times 76}$$

Bài giải

$$\begin{aligned} B &= \frac{3}{4 \times 7} + \frac{3}{7 \times 10} + \frac{3}{10 \times 13} + \dots + \frac{3}{73 \times 76} \\ &= \left(\frac{1}{4} - \frac{1}{7} + \frac{1}{7} - \frac{1}{10} + \frac{1}{10} - \frac{1}{13} + \dots + \frac{1}{73} - \frac{1}{76} \right) \\ &= \frac{1}{4} - \frac{1}{76} \\ &= \frac{9}{38} \end{aligned}$$

Vậy $B = \frac{9}{38}$

Bài 3: Tính giá trị biểu thức:

$$A = \frac{3}{4 \times 9} + \frac{3}{9 \times 14} + \frac{3}{14 \times 19} + \dots + \frac{3}{34 \times 39}$$

Bài giải

$$\begin{aligned} A &= \frac{3}{4 \times 9} + \frac{3}{9 \times 14} + \frac{3}{14 \times 19} + \dots + \frac{3}{34 \times 39} \\ &= 3 \times \left(\frac{1}{4 \times 9} + \frac{1}{9 \times 14} + \frac{1}{14 \times 19} + \dots + \frac{1}{34 \times 39} \right) \end{aligned}$$

Nhân cả hai vế với 5 ta có:

$$\begin{aligned} A \times 5 &= 3 \times 5 \times \left(\frac{1}{4 \times 9} + \frac{1}{9 \times 14} + \frac{1}{14 \times 19} + \dots + \frac{1}{34 \times 39} \right) \\ &= 3 \times \left(\frac{5}{4 \times 9} + \frac{5}{9 \times 14} + \frac{5}{14 \times 19} + \dots + \frac{5}{34 \times 39} \right) \\ &= 3 \times \left(\frac{1}{4} - \frac{1}{9} + \frac{1}{9} - \frac{1}{14} + \frac{1}{14} - \frac{1}{19} + \dots + \frac{1}{34} - \frac{1}{39} \right) \\ &= 3 \times \left(\frac{1}{4} - \frac{1}{39} \right) \\ &= 3 \times \frac{35}{156} \end{aligned}$$

$$= \frac{35}{52}$$

$$\text{Vậy } A = \frac{35}{52} : 5 = \frac{7}{52}$$

Bài 4: Tính giá trị biểu thức:

$$A = \frac{131313}{151515} + \frac{131313}{353535} + \frac{131313}{636363} + \frac{131313}{999999}$$

Bài giải

$$\begin{aligned} A &= \frac{131313}{151515} + \frac{131313}{353535} + \frac{131313}{636363} + \frac{131313}{999999} \\ &= \frac{131313:10101}{151515:10101} + \frac{131313:10101}{353535:10101} + \frac{131313:10101}{636363:10101} + \frac{131313:10101}{999999:10101} \\ &= \frac{13}{15} + \frac{13}{35} + \frac{13}{63} + \frac{13}{99} \\ &= \frac{13}{3 \times 5} + \frac{13}{5 \times 7} + \frac{13}{7 \times 9} + \frac{13}{9 \times 11} \\ &= 13 \times \left(\frac{1}{3 \times 5} + \frac{1}{5 \times 7} + \frac{1}{7 \times 9} + \frac{1}{9 \times 11} \right) \end{aligned}$$

Nhân cả hai vế với 2 ta có:

$$\begin{aligned} 2 \times A &= 13 \times 2 \times \left(\frac{1}{3 \times 5} + \frac{1}{5 \times 7} + \frac{1}{7 \times 9} + \frac{1}{9 \times 11} \right) \\ &= 13 \times \left(\frac{2}{3 \times 5} + \frac{2}{5 \times 7} + \frac{2}{7 \times 9} + \frac{2}{9 \times 11} \right) \\ &= 13 \times \left(\frac{1}{3} - \frac{1}{5} + \frac{1}{5} - \frac{1}{7} + \frac{1}{7} - \frac{1}{9} + \frac{1}{9} - \frac{1}{11} \right) \\ &= 13 \times \left(\frac{1}{3} - \frac{1}{11} \right) \\ &= 13 \times \frac{8}{33} \\ &= \frac{104}{33} \end{aligned}$$

$$\text{Vậy } A = \frac{104}{33} : 2 = \frac{52}{33}$$

Bài 5: Tính tổng

$$A = \frac{1}{1 \times 2 \times 3} + \frac{1}{2 \times 3 \times 4} + \frac{1}{3 \times 4 \times 5} + \dots + \frac{1}{48 \times 49 \times 50}$$

Bài giải

$$A = \frac{1}{1 \times 2 \times 3} + \frac{1}{2 \times 3 \times 4} + \frac{1}{3 \times 4 \times 5} + \dots + \frac{1}{48 \times 49 \times 50}$$

$$= \frac{1}{2} \times \left(\frac{2}{1 \times 2 \times 3} + \frac{2}{2 \times 3 \times 4} + \frac{2}{3 \times 4 \times 5} + \dots + \frac{2}{48 \times 49 \times 50} \right)$$

$$= \frac{1}{2} \times \left(\frac{1}{1 \times 2} - \frac{1}{2 \times 3} + \frac{1}{2 \times 3} - \frac{1}{3 \times 4} + \frac{1}{3 \times 4} + \dots + \frac{1}{48 \times 49} - \frac{1}{49 \times 50} \right)$$

$$= \frac{1}{2} \times \left(\frac{1}{1 \times 2} - \frac{1}{49 \times 50} \right)$$

$$= \frac{1}{2} \times \frac{612}{1225}$$

$$= \frac{306}{1225}$$

$$\text{Vậy } A = \frac{306}{1225}$$

Bài 6: Tính giá trị biểu thức:

$$A = 2 \frac{52}{82} \times \frac{91}{216} \times 3 \frac{116}{273} \times \frac{246}{935}$$

Bài giải

$$A = 2 \frac{52}{82} \times \frac{91}{216} \times 3 \frac{116}{273} \times \frac{246}{935}$$

$$= \frac{216}{82} \times \frac{91}{216} \times \frac{935}{273} \times \frac{246}{935}$$

$$= \frac{216 \times 91 \times 935 \times 246}{82 \times 216 \times 273 \times 935}$$

$$= \frac{91 \times 246}{82 \times 273}$$

$$= \frac{3}{3}$$

$$= 1$$

Vậy $A = 1$

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