**AMC 1985 Q1**

1.  $\dfrac{3 \times 5}{9 \times 11} \times \dfrac{7 \times 9 \times 11}{3 \times 5 \times 7} =$

  A)  1     B)  0     C)  49     D)  $\dfrac{1}{49}$     E)  50

1.  (A)  $\dfrac{3 \times 5}{9 \times 11} \times \dfrac{7 \times 9 \times 11}{3 \times 5 \times 7} = \dfrac{3 \times 5 \times 7 \times 9 \times 11}{3 \times 5 \times 7 \times 9 \times 11} = 1.$

1.  Which of the following is the largest?

  (A) $\dfrac{1}{3}$     (B) $\dfrac{1}{4}$     (C) $\dfrac{3}{8}$     (D) $\dfrac{5}{12}$     (E) $\dfrac{7}{24}$

**1994 Q1**

1. **(D)** Express all the choices as fractions using their least common denominator:

$$\frac{1}{3} = \frac{8}{24}, \quad \frac{1}{4} = \frac{6}{24}, \quad \frac{3}{8} = \frac{9}{24}, \quad \frac{5}{12} = \frac{10}{24}, \quad \frac{7}{24}.$$

Thus, $5/12$ is the largest.

**OR**

Express each choice as a decimal:

$\frac{1}{3} = 0.333\ldots$    $\frac{1}{4} = 0.25$    $\frac{3}{8} = 0.375$    $\frac{5}{12} = 0.41666\ldots$    $\frac{7}{24} = 0.291666\ldots$

Thus, $5/12$ is the largest.

**OR**

All choices are less than $1/2$, so the choice least distant from $1/2$ will be the largest:

| fraction : | 1/3 | 1/4 | 3/8 | **5/12** | 7/24 |
|---|---|---|---|---|---|
| distance from 1/2 : | 1/6 | 1/4 | 1/8 | **1/12** | 5/24 |

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**1997 Q1**

1. $\dfrac{1}{10} + \dfrac{9}{100} + \dfrac{9}{1000} + \dfrac{7}{10000} =$

**(A)** 0.0026    **(B)** 0.0197    **(C)** 0.1997    **(D)** 0.26    **(E)** 1.997

1. **(C)** In decimal form:

    0.1
    0.09
    0.009
    + 0.0007
    0.1997

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**1998 Q1**

1. For $x = 7$, which of the following is smallest?

   (A) $\dfrac{6}{x}$　　(B) $\dfrac{6}{x+1}$　　(C) $\dfrac{6}{x-1}$　　(D) $\dfrac{x}{6}$　　(E) $\dfrac{x+1}{6}$

1. **Answer (B):** Only $\frac{6}{7}$(A) and $\frac{6}{8}$(B) are less than 1. For fractions: If the numerators are equal, the smaller fraction will have a larger denominator. Therefore, $\frac{6}{8}$ is smaller than $\frac{6}{7}$(A).

2. $\dfrac{16 + 8}{4 - 2} =$

   (A) 4　　(B) 8　　(C) 12　　(D) 16　　(E) 20

**1991 Q2**

2. **(C)** Using the standard order of operations, first simplify the numerator and then the denominator. Finally compute the quotient:

$$\frac{16 + 8}{4 - 2} = \frac{24}{2} = 12.$$

**Note.** Keying $16 + 8 \div 4 - 2$ on the calculator will give an incorrect answer for this problem. The problem means $(16 + 8) \div (4 - 2) = 24 \div 2 = 12$.

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**1993 Q2**

2. When the fraction $\dfrac{49}{84}$ is expressed in simplest form, then the sum of the numerator and the denominator will be

(A) 11     (B) 17     (C) 19     (D) 33     (E) 133

2. (C) $\dfrac{49}{84} = \dfrac{7 \times 7}{7 \times 12} = \dfrac{7}{12}$.

The sum of the numerator and the denominator is $7 + 12 = 19$.

**1992 Q2**

2. Which of the following is not equal to $\dfrac{5}{4}$ ?

(A) $\dfrac{10}{8}$     (B) $1\dfrac{1}{4}$     (C) $1\dfrac{3}{12}$     (D) $1\dfrac{1}{5}$     (E) $1\dfrac{10}{40}$

2. (D) $1\dfrac{1}{5} = \dfrac{6}{5} \neq \dfrac{5}{4}$.

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**1989 Q2**

2.  $\dfrac{2}{10} + \dfrac{4}{100} + \dfrac{6}{1000} =$

A) .012      B) .0246      C) .12      D) .246      E) 246

2.     D      The sum is .2 + .04 + .006 = .246.

**1986 Q2**

2.  Which of the following numbers has the largest reciprocal?

A) $\dfrac{1}{3}$     B) $\dfrac{2}{5}$     C) 1     D) 5     E) 1986

2.  (A)     A large positive number has a small reciprocal and vice-versa. The smallest positive number $\dfrac{1}{3}$ has the largest reciprocal, $\dfrac{1}{\frac{1}{3}} = 3$.

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3. $\dfrac{1}{10} + \dfrac{2}{20} + \dfrac{3}{30} =$

A) .1    B) .123    C) .2    D) .3    E) .6

**1988 Q3**

3.    D    Since $\dfrac{2}{20} = \dfrac{3}{30} = \dfrac{1}{10}$, the desired sum is .1 + .1 + .1 = .3.

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**1995 Q3**

3. Which of the following operations has the same effect on a number as multiplying by $\dfrac{3}{4}$ and then dividing by $\dfrac{3}{5}$?

(A) dividing by $\dfrac{4}{3}$    (B) dividing by $\dfrac{9}{20}$    (C) multiplying by $\dfrac{9}{20}$

(D) dividing by $\dfrac{5}{4}$    (E) multiplying by $\dfrac{5}{4}$

3. (E) Since $\dfrac{3}{4} \div \dfrac{3}{5} = \dfrac{3}{4} \times \dfrac{5}{3} = \dfrac{5}{4}$, multiplying by $\dfrac{5}{4}$ has the same effect.

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3. $\dfrac{\frac{3}{8} + \frac{7}{8}}{\frac{4}{5}} =$

(A) 1     (B) $\dfrac{25}{16}$     (C) 2     (D) $\dfrac{43}{20}$     (E) $\dfrac{47}{16}$

**1998 Q3**

3. **Answer (B):** $\dfrac{3}{8} + \dfrac{7}{8} = \dfrac{10}{8} = \dfrac{5}{4}$. Therefore, $\dfrac{5}{4} \div \dfrac{4}{5} = \dfrac{5}{4} \cdot \dfrac{5}{4} = \dfrac{25}{16}$.

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**1989 Q4**

4. Estimate to determine which of the following numbers is closest to $\dfrac{401}{.205}$.

A) .2          B) 2          C) 20          D) 200          E) 2000

4.     E     $\dfrac{401}{.205} \approx \dfrac{400}{.2} = \dfrac{4000}{2} = 2000$ where $\approx$ means "is approximately equal to"

OR

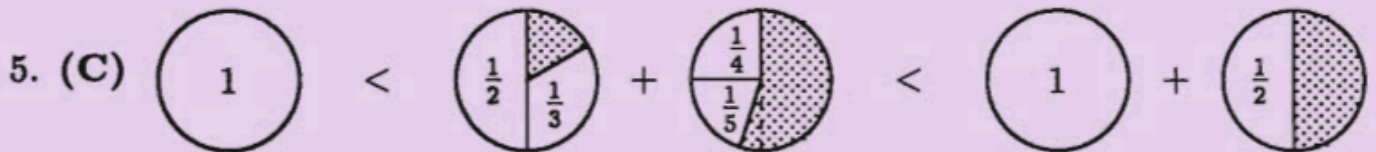$\dfrac{401}{.205} = \dfrac{1}{.205} \times 401 \approx 5 \times 400 = 2000$

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5. **Find the smallest whole number that is larger than the sum**

$$2\frac{1}{2} + 3\frac{1}{3} + 4\frac{1}{4} + 5\frac{1}{5}.$$

(A) 14     (B) 15     (C) 16     (D) 17     (E) 18

5. (C) 



The sum of the fractions adds between 1 and $1\frac{1}{2}$ to the sum of the whole numbers, which is $2+3+4+5 = 14$. Thus the overall sum is between 15 and $15\frac{1}{2}$, so the answer is 16.

OR

Since

$$1 < \frac{1}{2} + \frac{1}{4} + \frac{1}{4} + \frac{1}{5} < \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \frac{1}{5} < \frac{1}{2} + \frac{1}{2} + \frac{1}{2} + \frac{1}{2} = 2,$$

the sum of the fractions adds between 1 and 2 to the sum of the whole numbers, which is $2+3+4+5 = 14$. Thus the overall sum is between 15 and 16, so the answer is 16.

OR

Approximate the fractions as decimals and add $2.5 + 3.33 + 4.25 + 5.2$ which yields 15.28. Thus the answer is 16.