Regents Exam Questions
A.APR.D.7: Addition and Subtraction of Rationals 1
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Name: _____

A.APR.D.7: Addition and Subtraction of Rationals 1

1 What is $\dfrac{2+x}{5x} - \dfrac{x-2}{5x}$ expressed in simplest form?

   1) 0 2) $\dfrac{2}{5}$ 3) $\dfrac{4}{5x}$ 4) $\dfrac{2x+4}{5x}$

2 What is the sum of $\dfrac{3}{2x}$ and $\dfrac{4}{3x}$ expressed in simplest form?

   1) $\dfrac{12}{6x^2}$ 2) $\dfrac{17}{6x}$ 3) $\dfrac{7}{5x}$ 4) $\dfrac{17}{12x}$

3 The sum of $\dfrac{x}{2a}$ and $\dfrac{2x}{3a}$ is

   1) $\dfrac{3x}{5a}$ 2) $\dfrac{3x}{6a}$ 3) $\dfrac{7x}{6a}$ 4) $\dfrac{2x^2}{6a^2}$

4 What is the sum of $\dfrac{3}{2x}$ and $\dfrac{7}{4x}$?

   1) $\dfrac{21}{8x^2}$ 2) $\dfrac{13}{4x}$ 3) $\dfrac{10}{6x}$ 4) $\dfrac{13}{8x}$

5 The expression $\dfrac{a}{b} - \dfrac{1}{3}$ is equivalent to

   1) $\dfrac{a-1}{b-3}$ 2) $\dfrac{a-1}{3b}$ 3) $\dfrac{3a-b}{3b}$ 4) $\dfrac{3a-b}{b-3}$

6 What is $\dfrac{6}{5x} - \dfrac{2}{3x}$ in simplest form?

   1) $\dfrac{8}{15x^2}$ 2) $\dfrac{8}{15x}$ 3) $\dfrac{4}{15x}$ 4) $\dfrac{4}{2x}$

7 What is $\dfrac{6}{4a} - \dfrac{2}{3a}$ expressed in simplest form?

   1) $\dfrac{4}{a}$ 2) $\dfrac{5}{6a}$ 3) $\dfrac{8}{7a}$ 4) $\dfrac{10}{12a}$

8 Which fraction is equivalent to $\dfrac{4}{3a} - \dfrac{5}{2a}$?

   1) $-\dfrac{1}{a}$ 2) $-\dfrac{1}{5a}$ 3) $-\dfrac{7}{6a}$ 4) $-\dfrac{7}{6a^2}$

9 What is $\dfrac{10}{7x} - \dfrac{3}{5x}$ expressed in simplest form?

   1) $\dfrac{7}{2x}$ 2) $\dfrac{29}{2x}$ 3) $\dfrac{29}{35x}$ 4) $\dfrac{55}{35x}$

10 What is $\dfrac{7}{12x} - \dfrac{y}{6x^2}$ expressed in simplest form?

   1) $\dfrac{7-y}{6x}$ 2) $\dfrac{7-y}{12x-6x^2}$ 3) $-\dfrac{7y}{12x^2}$ 4) $\dfrac{7x-2y}{12x^2}$

11 What is the sum of $\dfrac{3x^2}{x-2}$ and $\dfrac{x^2}{x-2}$?

   1) $\dfrac{3x^4}{(x-2)^2}$ 2) $\dfrac{3x^4}{x-2}$ 3) $\dfrac{4x^2}{(x-2)^2}$ 4) $\dfrac{4x^2}{x-2}$

12 What is the sum of $\dfrac{2y}{y+5}$ and $\dfrac{10}{y+5}$ expressed in simplest form?

   1) 1 2) 2 3) $\dfrac{12y}{y+5}$ 4) $\dfrac{2y+10}{y+5}$

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13 The sum of $\dfrac{3x-4}{x+3}$ and $\dfrac{2x-5}{x+3}$ is

  1) $\dfrac{5x-9}{x+3}$ 2) $\dfrac{5x+1}{2x+6}$ 3) $\dfrac{5x-9}{x+6}$ 4) $\dfrac{5x+1}{x+3}$

14 What is the sum of $\dfrac{-x+7}{2x+4}$ and $\dfrac{2x+5}{2x+4}$?

  1) $\dfrac{x+12}{2x+4}$ 2) $\dfrac{3x+12}{2x+4}$ 3) $\dfrac{x+12}{4x+8}$ 4) $\dfrac{3x+12}{4x+8}$

15 The expression $\dfrac{2x+13}{2x+6} - \dfrac{3x-6}{2x+6}$ is equivalent to

  1) $\dfrac{-x+19}{2(x+3)}$ 2) $\dfrac{-x+7}{2(x+3)}$ 3) $\dfrac{5x+19}{2(x+3)}$

  4) $\dfrac{5x+7}{4x+12}$

16 The expression $\dfrac{3}{a-1} + \dfrac{3}{1-a}$ is equivalent to

  1) 0   2) $\dfrac{6}{a^2-1}$ 3) 6   4) $\dfrac{6}{1-a^2}$

17 Expressed in simplest form, $\dfrac{3y}{2y-6} + \dfrac{9}{6-2y}$ is

  equivalent to

  1) $\dfrac{-6y^2+36y-54}{(2y-6)(6-2y)}$ 2) $\dfrac{3y-9}{2y-6}$ 3) $\dfrac{3}{2}$ 4) $-\dfrac{3}{2}$

18 What is $\dfrac{x}{x-1} - \dfrac{1}{2-2x}$ expressed as a single

  fraction?

  1) $\dfrac{x+1}{x-1}$ 2) $\dfrac{2x-1}{2-2x}$ 3) $\dfrac{2x+1}{2(x-1)}$ 4) $\dfrac{2x-1}{2(x-1)}$

19 The expression $\dfrac{x^2+12}{x^2+3}$ can be rewritten as

  1) $\dfrac{10}{x^2+3}$ 2) $1+\dfrac{9}{x^2+3}$ 3) $x+9$ 4) 4

20 The expression $\dfrac{x^2+6}{x^2+4}$ is equivalent to

  1) $\dfrac{6}{4}$ 2) $1+\dfrac{10}{x^2+4}$ 3) $1-\dfrac{2}{x^2+4}$

  4) $1+\dfrac{2}{x^2+4}$

21 The expression $2-\dfrac{x-1}{x+2}$ is equivalent to

  1) $1-\dfrac{3}{x+2}$ 2) $1+\dfrac{3}{x+2}$ 3) $1-\dfrac{1}{x+2}$

  4) $1+\dfrac{1}{x+2}$

22 Algebraically prove that $\dfrac{x^3+9}{x^3+8} = 1+\dfrac{1}{x^3+8}$,

  where $x \neq -2$.

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Answer Section

1 ANS: 3

$$\frac{2+x}{5x} - \frac{x-2}{5x} = \frac{2+x-x+2}{5x} = \frac{4}{5x}$$

REF: 081027ia

2 ANS: 2

$$\frac{3}{2x} + \frac{4}{3x} = \frac{9x+8x}{6x^2} = \frac{17x}{6x^2} = \frac{17}{6x}$$

REF: 080917ia

3 ANS: 3

$$\frac{x}{2a} + \frac{2x}{3a} = \frac{3x}{6a} + \frac{4x}{6a} = \frac{7x}{6a}$$

REF: 061630ia

4 ANS: 2

$$\frac{3}{2x} + \frac{7}{4x} = \frac{12x+14x}{8x^2} = \frac{26x}{8x^2} = \frac{13}{4x}$$

REF: 011120ia

5 ANS: 3   REF: 061424ia

6 ANS: 2

$$\frac{6}{5x} - \frac{2}{3x} = \frac{18x-10x}{15x^2} = \frac{8x}{15x^2} = \frac{8}{15x}$$

REF: 010921ia

7 ANS: 2

$$\frac{6}{4a} - \frac{2}{3a} = \frac{18a-8a}{12a^2} = \frac{10a}{12a^2} = \frac{5}{6a}$$

REF: 060929ia

8 ANS: 3

$$\frac{4}{3a} - \frac{5}{2a} = \frac{8}{6a} - \frac{15}{6a} = -\frac{7}{6a}$$

REF: 081328ia

9 ANS: 3

$$\frac{10}{7x} - \frac{3}{5x} = \frac{50x-21x}{35x^2} = \frac{29x}{35x^2} = \frac{29}{35x}$$

REF: 011511ia

10 ANS: 4

$$\frac{7}{12x} - \frac{y}{6x^2} = \frac{42x^2 - 12xy}{72x^3} = \frac{6x(7x - 2y)}{72x^3} = \frac{7x - 2y}{12x^2}$$

REF: 061129ia

11 ANS: 4   REF: 011025ia

12 ANS: 2

$$\frac{2y}{y+5} + \frac{10}{y+5} = \frac{2y+10}{y+5} = \frac{2(y+5)}{y+5} = 2$$

REF: 011230ia

13 ANS: 1   REF: 081409ia

14 ANS: 1   REF: 061024ia

15 ANS: 1   REF: 061220ia

16 ANS: 1

$$\frac{3}{a-1} + \frac{3}{1-a} = \frac{3}{a-1} - \frac{3}{a-1} = 0$$

REF: 011716a2

17 ANS: 3

$$\frac{3y}{2y-6} + \frac{9}{6-2y} = \frac{3y}{2y-6} - \frac{9}{2y-6} = \frac{3y-9}{2y-6} = \frac{3(y-3)}{2(y-3)} = \frac{3}{2}$$

REF: 011325a2

18 ANS: 3

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

REF: 011608a2

19 ANS: 2

$$\frac{x^2 + 12}{x^2 + 3} = \frac{x^2 + 3}{x^2 + 3} + \frac{9}{x^2 + 3} = 1 + \frac{9}{x^2 + 3}$$

REF: 062218aii

20 ANS: 4

$$\frac{x^2 + 6}{x^2 + 4} = \frac{x^2 + 4}{x^2 + 4} + \frac{2}{x^2 + 4} = 1 + \frac{2}{x^2 + 4}$$

REF: 082321aii

21 ANS: 2

$$2 - \frac{x-1}{x+2}$$

$$1 + \frac{x+2}{x+2} - \frac{x-1}{x+2}$$

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

$$1 + \frac{3}{x+2}$$

REF: 081907aii

22 ANS:

$$\frac{x^3+9}{x^3+8} = \frac{x^3+8}{x^3+8} + \frac{1}{x^3+8}$$

$$\frac{x^3+9}{x^3+8} = \frac{x^3+9}{x^3+8}$$

REF: 061631aii