Решение контрольной работы № 5
«Алгебраические дроби»
Вариант 1

1) 1) $\frac{5+a}{2a^2}+\frac{1-2a}{a}=\frac{5+a}{2a^2}+\frac{2a-4a^2}{2a^2}=\frac{5+a+2a-4a^2}{2a^2}=\frac{-4a^2+3a+5}{2a^2}$

2) $\frac{4x+8}{12x^3}\cdot\frac{3x}{x+2}=\frac{4(x+2)}{4x^2}\cdot\frac{1}{x+2}=\frac{1}{x^2}\cdot\frac{1}{1}=\frac{1}{x^2}$

3) $(m+n)^2:\frac{m^2-n^2}{8m}=\frac{(m+n)^2}{1}\cdot\frac{8m}{m^2-n^2}=$

$=\frac{(m+n)^2}{1}\cdot\frac{8m}{(m-n)(m+n)}=\frac{m+n}{1}\cdot\frac{8m}{m-n}=\frac{8m^2+8mn}{m-n}$

Ответ: 1) $\frac{-4a^2+3a+5}{2a^2}$ 2) $\frac{1}{x^2}$ 3) $\frac{8m^2+8mn}{m-n}$.

2) $\frac{3}{y}-\frac{y^2-9}{y^3}\cdot\frac{y}{3+y}=\frac{3}{y}-\frac{(y-3)(y+3)}{y^2}\cdot\frac{1}{y+3}=\frac{3}{y}-\frac{y-3}{y^2}\cdot\frac{1}{1}=$

$=\frac{3}{y}-\frac{y-3}{y^2}=\frac{3y}{y^2}-\frac{y-3}{y^2}=\frac{3y-y+3}{y^2}=\frac{2y+3}{y^2}$

Ответ: $\frac{2y+3}{y^2}$.

3) $\frac{25a^2-b^2}{25a^2-10ab+b^2}:(5a^2+ab)\cdot(2b-10a)=$

$=\frac{(5a-b)(5a+b)}{(5a-b)^2}\cdot\frac{1}{a(5a+b)}\cdot\frac{2(b-5a)}{1}=$

$=\frac{1}{5a-b}\cdot\frac{2(b-5a)}{a}=-\frac{1}{5a-b}\cdot\frac{2(5a-b)}{a}=-\frac{2}{a};\ -\frac{2}{25}=-0{,}08$

Ответ: $-\frac{2}{a}$; $-0{,}08$.

4) $\left(\frac{2n}{3+n}+\frac{9}{n^2-3n+9}-\frac{n^3-15n^2}{n^3+27}\right)\cdot\left(n+3-\frac{9n}{n+3}\right):(n+3)=$

$=\frac{2n^3-6n^2+18n+27+9n-n^3+15n^2}{(n+3)(n^2-3n+9)}\cdot\frac{(n+3)^2-9n}{n+3}:\frac{n+3}{1}=$

$=\frac{n^3+9n^2+27n+27}{(n+3)(n^2-3n+9)}\cdot\frac{n^2+6n+9-9n}{n+3}\cdot\frac{1}{n+3}=$

$=\frac{(n^3+27)+(9n^2+27n)}{(n+3)(n^2-3n+9)}\cdot\frac{n^2-3n+9}{n+3}\cdot\frac{1}{n+3}=$

$$= \frac{(n+3)(n^2-3n+9)+9n(n+3)}{n+3} \cdot \frac{1}{n+3} \cdot \frac{1}{n+3} =$$

$$= \frac{\cancel{(n+3)}(n^2-3n+9+9n)}{\cancel{n+3}} \cdot \frac{1}{n+3} \cdot \frac{1}{n+3} =$$

$$= \frac{n^2+6n+9}{(n+3)^2} = \frac{(n+3)^2}{(n+3)^2} = 1$$

Ответ: 1.

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