College Algebra CHS

Name Key

Rational Expressions Part 1

Date

State the excluded values for each.

1) $\frac{36r}{40r^2}$ $\frac{9}{10r}$ $\{0\}$

2) $\frac{42n^2}{12n+48}$ $\frac{42n^2}{12(n+4)} = \frac{7n^2}{2(n+4)}$ $\{-4\}$

3) $\frac{2r-2}{6r^2-25r-25}$ $\frac{2(r-1)}{(r-5)(6r+5)}$

$6r^2+5r-30r-25$

$r(6r+5)-5(6r+5)$

-150, $5 \cdot -30$

$\{5, -5/6\}$

4) $\frac{2r^2-8r+8}{3r^3-8r^2+4r}$ $\{0, 2, 2/3\}$

$r(3r^2-8r+4)$

$r(3r^2-6r-2r+4)$

$r(3r(r-2)-2(r-2))$

$r(r-2)(3r-2)$

Simplify each expression.

5) $\frac{12b}{16b}$ $\frac{3}{4}$ $b \neq 0$

6) $\frac{36b^2}{36b^3}$ $\frac{1}{b}$ $b \neq 0$

7) $\frac{25}{35r-20}$ $\frac{25}{5(7r-4)} = \frac{5}{7r-4}$ $r \neq 4/7$

8) $\frac{x^2-8x+7}{x-7}$ $\frac{(x-7)(x-1)}{(x-7)} = x-1$ $x \neq 7$

9) $\frac{16k+72}{24k+56}$ $\frac{8(2k+9)}{8(3k+7)} = \frac{2k+9}{3k+7}$ $k \neq -7/3$

10) $\frac{9x-18}{x^2-7x+10}$ $\frac{9(x-2)}{(x-5)(x-2)} = \frac{9}{x-5}$ $x \neq 5$, $x \neq 2$

-60 / -15 4 105 / -15 -7

11) $\dfrac{15b^3 - 33b^2 - 36b}{5b^2 - 22b + 21}$

$\dfrac{3b(5b^2-11b-12)}{5b^2-22b+21} = \dfrac{3b(5b^2-15b+4b-12)}{5b^2-15b-7b+21}$

$= \dfrac{3b[5b(b-3)+4(b-3)]}{5b(b-3)-7(b-3)} = \dfrac{3b(b-3)(5b+4)}{(b-3)(5b-7)}$

$= \boxed{\dfrac{3b(5b+4)}{5b-7}}$ $b \neq 3$, $b \neq 7/5$

12) $\dfrac{2n^2 - 18n + 16}{15n^3 - 135n^2 + 120n}$

$\dfrac{2(n^2-9n+8)}{15n(n^2-9n+8)} = \dfrac{2(n-8)(n-1)}{15n(n-8)(n-1)}$

$\boxed{\dfrac{2}{15n}}$

$n \neq 8$, $n \neq 1$

13) $\dfrac{12n^2 - 12}{20n + 20}$ $\dfrac{12(n^2-1)}{20(n+1)} = \dfrac{12(n-1)(n+1)}{20(n+1)}$

$\boxed{\dfrac{3(n-1)}{5}}$

$n \neq -1$

14) $\dfrac{4x^2 + 6x + 2}{3x + 21} = \dfrac{2(2x^2+3x+1)}{3(x+7)}$

$= \dfrac{2(2x^2+2x+x+1)}{3(x+7)} = \dfrac{2[2x(x+1)+1(x+1)]}{3(x+7)}$

$= \boxed{\dfrac{2(x+1)(2x+1)}{3(x+7)}}$

$x \neq -7$

15) $\dfrac{14v^3 - 38v^2 - 12v}{3v^2 - 16v + 21}$ $\dfrac{-42}{-21\ +2}$ $\dfrac{63}{-9\ -7}$

$\dfrac{2v(7v^2-19v-6)}{3v^2-16v+21} = \dfrac{2v(7v^2-21v+2v-6)}{(3v^2-9v-7v+21)} =$

$\dfrac{2v[7v(v-3)+2(v-3)]}{3v(v-3)-7(v-3)} = \dfrac{2v(v-3)(7v+2)}{(v-3)(3v-7)}$

$\boxed{\dfrac{2v(7v+2)}{3v-7}}$ $v \neq 3$, $v \neq 9/3$

16) $\dfrac{2n^2 - 11n + 9}{21n^3 - 48n^2 + 27n}$ $\dfrac{18}{-9\ -2}$ $\dfrac{63}{-9\ -7}$

$\dfrac{2n^2-9n-2n+9}{3n(7n^2-16n+9)} = \dfrac{n(2n-9)-1(2n-9)}{3n[7n^2-9n-7n+9]} =$

$\dfrac{(n-1)(2n-9)}{3n[n(7n-9)-1(7n-9)]} = \dfrac{(n-1)(2n-9)}{3n(n-1)(7n-9)}$

$\boxed{\dfrac{2n-9}{3n(7n-9)}}$

$n \neq 0$, $n \neq 9/7$, $n \neq 1$

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8) $\frac{x^2-8x+7}{x-7}$

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10) $\frac{9x-18}{x^2-7x+10}$

11) $\dfrac{15b^3 - 33b^2 - 36b}{5b^2 - 22b + 21}$

12) $\dfrac{2n^2 - 18n + 16}{15n^3 - 135n^2 + 120n}$

13) $\dfrac{12n^2 - 12}{20n + 20}$

14) $\dfrac{4x^2 + 6x + 2}{3x + 21}$

15) $\dfrac{7v^3 - 67v^2 + 36v}{8v^2 + 56v}$

16) $\dfrac{2n^2 - 11n + 9}{21n^3 - 48n^2 + 27n}$