Math 11 Name_____

Multiplying and Dividing Rational Expressions

Date_____

Multiply: Factor, cross out common factors, rewrite, then state restrictions from denominator.

1) $\frac{3x-21}{x^2-11x+28} \times \frac{x^2-3x-4}{3x+3}$

$= \frac{3(x-7)}{(x-7)(x-4)} \times \frac{(x-4)(x+1)}{3(x+1)}$

$= 1 \quad \{x \neq -1, 4, 7\}$

2) $\frac{10a^2-10a}{a^2-2a+1} \times \frac{a^2+9a-10}{a^2+19a+90}$

$= \frac{10a(a-1)}{(a-1)(a-1)} \times \frac{(a+10)(a-1)}{(a+9)(a+10)}$

$= \frac{10a}{(a+9)} \quad \{a \neq -10, -9, 1\}$

3) $\frac{p+7}{p^2-11p+30} \cdot \frac{6p+42}{p^2+14p+49}$

4) $\frac{x^2-2x-48}{x^2-6x-16} \cdot \frac{5x+10}{5x-40}$

5) $\frac{r^2-9r+14}{r-7} \cdot \frac{9r^2+81r}{r^2+16r+63}$

6) $\frac{x^2-9x+14}{10x-20} \cdot \frac{10x-70}{x^2-8x+7}$

7) $\dfrac{x^2-9}{x^2+2x-3} \cdot \dfrac{x^2+8x-9}{x^2+18x+81}$

8) $\dfrac{8n^2}{n^2-9n+8} \cdot \dfrac{n^2-7n+6}{3n-18}$

Divide: Factor, flip second fraction and change to multiply. Reduce, rewrite, then state restrictions from first denominator and ENTIRE second fraction.

9) $\dfrac{6v+48}{v+8} \div \dfrac{28v-20}{56v^2-40v}$

$\neq 0$

$= \dfrac{6(v+8)}{(v+8)} \times \dfrac{8^2 v(7v-5)}{4(7v-5)}$

$= 12v \quad \{v \neq -8, 0, \frac{5}{7}\}$

10) $\dfrac{n^2-5n-14}{24n^2+40n} \div \dfrac{n^2+7n+10}{24n^2+40n}$

$= \dfrac{(n-7)(n+2)}{8n(3n+5)} \times \dfrac{8n(3n+5)}{(n+2)(n+5)}$

$= \dfrac{(n-7)}{(n+5)} \quad \{n \neq -5, -2, -\frac{5}{3}, 0\}$

11) $\dfrac{n^2+2n-80}{6n+60} \div \dfrac{n^2-17n+72}{n^2-81}$

$(n+9)(n-9)$

12) $\dfrac{x^2-9x+18}{x^2-64} \div \dfrac{x^2-2x-3}{x+8}$

13) $\dfrac{n^2 - 5n + 4}{6n - 6} \div \dfrac{8n - 32}{6n + 54}$

14) $\dfrac{8m - 24}{m^2 + 4m - 21} \div \dfrac{8}{2m + 14}$

15) $\dfrac{3x + 18}{x^2 - x - 2} \div \dfrac{3x + 15}{x^2 + 6x + 5}$

16) $\dfrac{63}{r^2 - 6r + 9} \div \dfrac{r + 5}{r^2 + 2r - 15}$

17) $\dfrac{9x + 36}{9} \div \dfrac{x^2 - 4}{x^2 - 5x - 14}$

18) $\dfrac{x^2 - 64}{6x - 48} \div \dfrac{x + 9}{6x + 54}$

Multiply.

19) $\dfrac{10x^2 - 53x + 36}{16x^2 - 72x} \cdot \dfrac{8x^2 + 40x}{5x^2 + 46x - 40}$

20) $\dfrac{7r^2 - 59r + 70}{21r^2 + 40r - 100} \cdot \dfrac{21r^2 + 64r - 20}{63r - 18}$

Divide.

21) $\dfrac{14n^2 - 11n + 2}{18n^3 - 9n^2} \div \dfrac{49n - 14}{2n}$

22) $\dfrac{2n^2 + 26n + 72}{5n - 50} \div \dfrac{14n^2 + 42n - 56}{35n - 35}$