WS 13.2 & 13.3

Name_____**KEY**_____

Date_____ Period_____

Simplify each and state the excluded values.

1) $\dfrac{30n^3}{48n^2} = \boxed{\dfrac{5n}{8}} , n \neq 0$

2) $\dfrac{5x^2 - 15x}{x - 3} = \dfrac{5x(x-3)}{(x-3)} = \boxed{5x, \ x \neq 3}$

3) $\dfrac{n^2 + 2n - 48}{2n^2 + 16n} = \dfrac{(n+8)(n-6)}{2n(n+8)}$

$= \boxed{\dfrac{(n-6)}{2n} , n \neq 0, -8}$

4) $\dfrac{r^2 - 49}{r^2 + 12r + 35} = \dfrac{(r+7)(r-7)}{(r+7)(r+5)}$

$= \boxed{\dfrac{(r-7)}{(r+5)} , r \neq -7, -5}$

5) $\dfrac{3b^3 + 24b^2 + 21b}{2b^3 - 2b^2 - 4b} = \dfrac{3b(b^2+8b+7)}{2b(b^2-b-2)}$

$= \dfrac{3(b+7)(b+1)}{2(b-2)(b+1)} = \boxed{\dfrac{3(b+7)}{2(b-2)} \quad b \neq 2, -1, 0}$

6) $\dfrac{2n^2 - 4n - 96}{2n^3 - 2n^2 - 84n} = \dfrac{2(n^2 - 2n - 48)}{2n(n^2 - n - 42)}$

$= \dfrac{(n-8)(n+6)}{n(n-7)(n+6)} = \boxed{\dfrac{(n-8)}{n(n-7)} \quad n \neq 0, 7, -6}$

Simplify each expression.

7) $\dfrac{16n^2 + 8n}{6 + 10n - 4n^2} \div \dfrac{8n^2 + 64n}{2n^2 - 10n + 12}$

$= \dfrac{8n(2n+1)}{-4n^2 + 10n + 6} \cdot \dfrac{2(n^2 - 5n + 6)}{8n(n+8)}$

$-2(2n^2 - 5n - 3)$
$-2(2n+1)(n-3)$

$= \dfrac{8n(2n+1)}{-2(2n+1)(n-3)} \cdot \dfrac{2(n-3)(n-2)}{8n(n+8)} = \boxed{-\dfrac{n-2}{n+8}}$

8) $\dfrac{10x + 50}{20x - 10} \div \dfrac{8x^2 - 64x}{2x - 1} = \dfrac{10(x+5)}{10(2x-1)} \cdot \dfrac{2x-1}{8x(x-8)}$

$= \boxed{\dfrac{x+5}{8x(x-8)}}$

9) $\dfrac{3a^2 + 31a + 56}{21a^2 + 76a + 63} \cdot \dfrac{49a^2 + 105a + 54}{7a + 6}$

$= \dfrac{(3a+7)(a+8)}{(3a+7)(7a+9)} \cdot \dfrac{(7a+6)(7a+9)}{7a+6}$

$= \boxed{a+8}$

10) $\dfrac{7x^2 - 66x + 27}{-7x^2 + 59x - 24} \cdot \dfrac{3x}{3x^2 - 30x}$

$= \dfrac{(x-9)(7x-3)}{-(x-8)(7x-3)} \cdot \dfrac{3x}{3x(x-10)}$

$= \boxed{\dfrac{-(x-9)}{(x-8)(x-10)}}$

11) $\dfrac{6n^2 - 17n + 12}{6n^2 - 5n - 6} \cdot \dfrac{3n^2 + 5n + 2}{3n - 4}$

$= \dfrac{(2n-3)(3n-4)}{(2n-3)(3n+2)} \cdot \dfrac{(n+1)(3n+2)}{3n-4}$

$= \boxed{n+1}$

12) $\dfrac{5x - 5}{x^2 + 18x + 80} \div \dfrac{10x^2 + 40x - 50}{20x^2 + 100x}$

$\dfrac{5(x-1)}{(x+8)(x+10)} \cdot \dfrac{20x(x+5)}{10(x+5)(x-1)}$

$= \boxed{\dfrac{10x}{(x+8)(x+10)}}$

13) $\dfrac{20 - 25r}{25r^2 - 35r + 12} \div \dfrac{1}{35r - 21}$

$= \dfrac{-5(5r-4)}{(5x-3)(5x-4)} \cdot \dfrac{7(5r-3)}{1}$

$= \boxed{-35}$

14) $\dfrac{3n^2 - n - 10}{12n^2 + 20n} \cdot \dfrac{7n - 63}{7}$

$= \dfrac{(n-2)(3n+5)}{4n(3n+5)} \cdot \dfrac{7(n-9)}{7}$

$= \boxed{\dfrac{(n-2)(n-9)}{4n}}$

15) $\dfrac{x + 6y}{25x^3} - \dfrac{2y}{25x^3}$

$= \boxed{\dfrac{x+4y}{25x^3}}$

16) $\dfrac{x - 3}{2x^2 - 18} + \dfrac{4x + 5}{2x^2 - 18}$

$= \dfrac{5x+2}{2(x^2-9)} = \boxed{\dfrac{5x+2}{2(x+3)(x-3)}}$

17) $\dfrac{v^3}{v^3} \cdot \dfrac{5v}{6u} + \dfrac{u+4v}{6v^3} \cdot \dfrac{u}{u}$

$= \dfrac{5v^4 + (u^2 + 4uv)}{6uv^3}$

$= \boxed{\dfrac{5v^4 + u^2 + 4uv}{6uv^3}}$

18) $\dfrac{b+5}{b+5} \cdot \dfrac{2b}{3b+3} - \dfrac{2}{b+5} \cdot \dfrac{3b+3}{3b+3}$

$\downarrow$
$3(b+1)$

$= \dfrac{(2b^2 + 10b) - (6b+6)}{(3b+3)(b+5)}$

$= \dfrac{2b^2 + 4b - 6}{3(b+1)(b+5)} = \boxed{\dfrac{2(b+3)(b-1)}{3(b+1)(b+5)}}$

19) $\dfrac{6v+36}{6v+36} \cdot \dfrac{2v}{v+2} - \dfrac{4}{6v+36} \cdot \dfrac{v+2}{v+2}$

$= \dfrac{(12v^2 + 72v) - (4v+8)}{6(v+2)(v+6)}$

$= \dfrac{12v^2 + 68v - 8}{6(v+2)(v+6)} = \dfrac{4(3v^2 + 17v - 2)}{6(v+2)(v+6)} = \boxed{\dfrac{2(3v^2 + 17v - 2)}{3(v+2)(v+6)}}$

20) $\dfrac{x+5}{x+5} \cdot \dfrac{6x}{5x-4} - \dfrac{x+1}{x+5} \cdot \dfrac{5x-4}{5x-4}$

$= \dfrac{6x^2 + 30x - (5x^2 + x - 4)}{(5x-4)(x+5)}$

$= \boxed{\dfrac{x^2 + 29x + 4}{(5x-4)(x+5)}}$

21) $\dfrac{k-6}{k-6} \cdot \dfrac{k+7}{k+6} + \dfrac{k-2}{k-6} \cdot \dfrac{k+6}{k+6}$

$= \dfrac{(k^2 + k - 42) + (k^2 + 4k - 12)}{(k+6)(k-6)}$

$= \boxed{\dfrac{2k^2 + 5k - 54}{(k+6)(k-6)}}$

22) $\dfrac{5v+2}{5v+2} \cdot \dfrac{3}{7v-3} + \dfrac{2}{5v+2} \cdot \dfrac{7v-3}{7v-3}$

$= \dfrac{15v + 6 + (14v - 6)}{(7v-3)(5v+2)}$

$= \boxed{\dfrac{29v}{(7v-3)(5v+2)}}$

23) $\dfrac{3b+8}{3b+8} \cdot \dfrac{5}{b+4} + \dfrac{4b}{3b+8} \cdot \dfrac{b+4}{b+4}$

$= \dfrac{15b + 40 + (4b^2 + 16b)}{(b+4)(3b+8)}$

$= \boxed{\dfrac{4b^2 + 31b + 40}{(b+4)(3b+8)}}$

24) $\dfrac{3m-2}{3m-2} \cdot \dfrac{6}{m-5} + \dfrac{5}{3m-2} \cdot \dfrac{m-5}{m-5}$

$= \dfrac{18m - 12 + (5m - 25)}{(m-5)(3m-2)}$

$= \boxed{\dfrac{23m - 37}{(m-5)(3m-2)}}$

25) $\overset{5r+8}{\cdot}\dfrac{7}{3r^3+24r^2}+\dfrac{5r}{5r+8}\cdot\overset{3r^3+24r^2}{}$

$3r^2(r+8)$

$=\dfrac{35r+56+(15r^4+120r^3)}{3r^2(r+8)(5r+8)}$

$=\boxed{\dfrac{15r^4+120r^3+35r^2+56}{3r^2(r+8)(5r+8)}}$

26) $\overset{3n-9}{\cdot}\dfrac{6}{n+3}-\dfrac{n-6}{3n-9}\cdot n+3$

$3(n-3)$

$=\dfrac{18n-54-(n^2-3n-18)}{3(n+3)(n-3)}$

$=\boxed{\dfrac{-n^2+21n-36}{3(n+3)(n-3)}}$

27) $\dfrac{\frac{4x}{5}}{\frac{x^2}{5}}=\dfrac{4x}{5}\cdot\dfrac{5}{x^2}$

$=\boxed{\dfrac{4}{x}}$

28) $\dfrac{\frac{1}{2}}{\frac{u}{2u+6}}=\dfrac{1}{2}\cdot\dfrac{2u+6}{u}$

$=\dfrac{1}{2}\cdot\dfrac{2(u+3)}{u}=\boxed{\dfrac{u+3}{u}}$

29) $\dfrac{\frac{25}{4}}{\overset{5\cdot}{}\frac{25}{x}+\frac{4}{5}\overset{\cdot x}{}}=\dfrac{25}{4}\cdot\dfrac{5x}{4x+125}$

$=\dfrac{4x+125}{5x}\qquad=\boxed{\dfrac{125x}{4(4x+125)}}$

30) $\dfrac{\frac{a+3}{a-1}}{\frac{3a-1}{a-1}}=\dfrac{a+3}{a-1}\cdot\dfrac{a-1}{3a-1}$

$=\boxed{\dfrac{a+3}{3a-1}}$

31) $\dfrac{\frac{x-2}{x+8}}{\frac{2}{x+8}}=\dfrac{x-2}{x+8}\cdot\dfrac{x+8}{2}$

$=\boxed{\dfrac{x-2}{2}}$

32) $\dfrac{\frac{36}{u-7}}{\frac{6}{u-7}}=\dfrac{36}{u-7}\cdot\dfrac{u-7}{6}$

$=\boxed{6}$

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