

12. Express in simplest form:

$$\frac{4x+8}{x+1} \cdot \frac{2-x}{3x-15} \div \frac{x^2-4}{2x^2-8x-10} \rightarrow 2(x^2-4x-5)$$

$$2(x-5)(x+1)$$

$$\frac{4(x+2)}{x+1} \cdot \frac{2-x}{3(x-5)} \cdot \frac{2(x-5)(x+1)}{(x+2)(x-2)}$$

$$= -\frac{8}{3}$$

13. Simplify:

$$\frac{m}{mn-n^2} - \frac{1}{m-n} - \frac{1}{n}$$

$$\frac{m}{n(m-n)} - \frac{1 \cdot n}{(m-n)n} - \frac{1(m-n)}{n(m-n)}$$

$$= \frac{\cancel{m} - \cancel{n} - \cancel{m} + \cancel{n}}{n(m-n)} = \frac{0}{n(m-n)} = 0$$

1. Simplify $\sqrt[4]{16a^6b^4}$.

$$\begin{aligned}
 &= \sqrt[4]{2^4 a^4 a^2 b^4} \\
 &= 2ab \sqrt[4]{a^2} \rightarrow (a^2)^{\frac{1}{4}} = \sqrt{a} \\
 &= a^{\frac{2}{4}} = a^{\frac{1}{2}}
 \end{aligned}$$

$(a^5)^{\frac{1}{10}}$

2. Express in simplest form, $\sqrt{-18} - \sqrt{-8}$.

$$\begin{aligned}
 &\sqrt{-18} = \sqrt{9 \cdot 2} = 3i\sqrt{2} \\
 &\sqrt{-8} = \sqrt{4 \cdot 2} = 2i\sqrt{2} \\
 &3i\sqrt{2} - 2i\sqrt{2} = i\sqrt{2}
 \end{aligned}$$

3. Evaluate $i^{12} - i^{13} + i^{14}$

$$\begin{aligned}
 &\sqrt[4]{12} \\
 &3 \quad | -i - 1 \\
 &\quad \boxed{-i}
 \end{aligned}$$

$$\begin{aligned}
 &i^n \rightarrow \frac{n}{4} \\
 &\begin{array}{l}
 . \quad i^0 = 1 \\
 .25 \quad i^1 = i \\
 .5 \quad i^2 = -1 \\
 .75 \quad i^3 = -i
 \end{array}
 \end{aligned}$$

$$\begin{aligned}
 & i^{2015} + i^{2016} - i^{2017} \\
 &= i^3 + i^0 - i^1 \\
 &= -i + 1 - i \\
 &= -2i + 1
 \end{aligned}$$

expression $\frac{3x^{-4}y^5}{(2x^3y^{-7})^{-2}}$ and write the answer using only positive exponents

$$\begin{aligned}
 &= \frac{3x^{-4}y^5}{2^{-2}x^{-6}y^{14}} = \frac{3 \cancel{y^5} 2^2 \cancel{x^6} x^2}{\cancel{x^4} \cancel{y^{14}} y^9} \\
 &= \boxed{\frac{12x^2}{y^9}}
 \end{aligned}$$