

$$\left\{ \frac{1}{x+4} + \frac{2x-3}{x^2+4x} = \frac{1}{x} \right. \quad x(x+4) \neq 0$$

$$\frac{1 \cdot x}{x+4 \cdot x} + \frac{2x-3}{x(x+4)} = \frac{1(x+4)}{x(x+4)} \quad x \neq 0$$

$$\left\{ \frac{x}{x(x+4)} + \frac{2x-3}{x(x+4)} = \frac{x+4}{x(x+4)} \right. \quad \begin{array}{l} x+4 \neq 0 \\ -4 -4 \\ x \neq -4 \end{array}$$

$$x + 2x - 3 = x + 4$$

$$3x - 3 = x + 4$$

$$\begin{array}{r} 3x = x + 7 \\ -x \quad -x \end{array}$$

$$\boxed{x = \frac{7}{2}}$$

$$\frac{2x}{2} = \frac{7}{2}$$

$$\frac{a-5}{a+2} - \frac{a-3}{3a+6} = 1$$

$$\boxed{3(a-5)} - \boxed{(a-3)} = 3(a+2)$$

$$3a - 15 - a + 3 = 3a + 6$$

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

$$\begin{array}{r} 2a - 12 = 3a + 6 \\ -2a \quad -2a \end{array}$$

$$\begin{array}{r} -12 = a + 6 \\ -6 \quad -6 \end{array}$$

$$\boxed{\frac{3(a-5)}{3(a+2)}} - \frac{a-3}{3(a+2)} = \frac{3(a+2)}{3(a+2)}$$

$$\boxed{-18 = a}$$

$$\frac{3(a+2) \neq 0}{3} \quad \begin{array}{l} a+2 \neq 0 \\ -2 \quad -2 \quad a \neq -2 \end{array}$$

$$-404 = -5(3k + 105)^{4/3} + 1$$

$\sqrt[4]{}$ 4th power
 $\sqrt[3]{}$ ← cube root

$$-404 = -5u^{4/3} + 1$$

$3(-26) + 105$
 $-78 + 105$
⊕
"a substitution"

$$3k + 105 = u$$

$$\frac{-405}{-5} = \frac{-5u}{-5}$$

$$(81)^{3/4} = (u^{4/3})^{3/4}$$

$$\left(\sqrt[4]{81}\right)^3 = u$$

$$3^3 = u = 27$$

$$x^{3/4} = \left(\sqrt[4]{x}\right)^3$$

$$x^{8/5} = \left(\sqrt[5]{x}\right)^8$$

$$\begin{array}{r} 27 = 3k + 105 \\ -105 \quad -105 \\ \hline -78 = 3k \end{array}$$

$$\frac{-78}{3} = \frac{3k}{3} \quad \boxed{k = -26}$$

$$-4(m-13)^{3/5} + 5 = -27$$

odd —
no restrictions

$$\frac{-4u^{3/5} + 5}{-5} = \frac{-27}{-5}$$

$$\frac{-4u^{3/5}}{-4} = \frac{-32}{-4}$$

$$\left(u^{3/5}\right)^{5/3} = \left(8\right)^{5/3}$$

$$[m - 13 = u]$$

$$u = 8^{5/3}$$

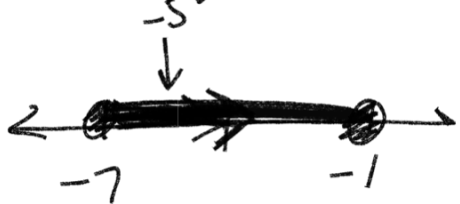
$$u = \left(\sqrt[3]{8}\right)^5 = 2^5 = 32$$

$$u = 32$$

$$\begin{array}{r} m - 13 = 32 \\ +13 \quad +13 \\ \hline \end{array}$$

$$\boxed{m = 45}$$

$$\sqrt{2n+14} = \sqrt{-1-n}$$



$$\left(\sqrt{2n+14}\right)^2 = \left(\sqrt{-1-n}\right)^2$$

$$2n+14 = -1-n$$

$$+n \qquad \qquad +n$$

$$3n+14 = -1$$

$$-14 \quad -14$$

$$\boxed{n = -5}$$

$$\frac{3n}{3} = \frac{-15}{3}$$

$$\left(\sqrt{-2n}\right)^2 = \left(\sqrt{n+7}\right)^2$$

$$-2n = n+7$$

$$-n \quad -n$$

$$\frac{-3n}{-3} = \frac{7}{-3}$$

$$\boxed{n = -\frac{7}{3}}$$

$$2n+14 \geq 0$$

$$-1-n \geq 0$$

$$\begin{matrix} > < \\ & 0 \end{matrix}$$

$$2n+14 \geq 0$$

$$-14 \quad -14$$

$$\begin{matrix} \geq < \\ & \text{Ⓢ} \end{matrix}$$

$$\frac{2n}{2} \geq \frac{-14}{2}$$

$$\boxed{n \geq -7}$$

$$-1-n \geq 0$$

$$+1 \qquad \qquad +1$$

$$\frac{-n}{-1} \geq \frac{1}{-1}$$

$$n \leq -1$$

Absolute Value

Distance from a number to zero on a number line

$$|5| = 5$$

$$|-5| = 5$$

$$5 \quad \begin{array}{c} \curvearrowright \\ \downarrow \downarrow \\ |2x+7| = 5 \\ \downarrow \downarrow \\ -5 \end{array}$$

$$2x+7 = 5$$
$$\begin{array}{r} -7 \quad -7 \\ \hline 2x = -2 \\ \frac{2}{2} \quad \frac{-2}{2} \end{array}$$

$$\frac{2x}{2} = \frac{-2}{2}$$

$$x = -1$$

$$2x+7 = -5$$
$$\begin{array}{r} -7 \quad -7 \\ \hline 2x = -12 \\ \frac{2x}{2} = \frac{-12}{2} \end{array}$$

$$\frac{2x}{2} = \frac{-12}{2}$$

$$x = -6$$

$$|x-3| = -1$$

No solution

NS

$$|x+7| = 2x+8$$

$$2x+8$$

$$2(-1)+8$$

$$-2+8 = 6$$

$$x+7 = 2x+8$$
$$\begin{array}{r} -x \quad -x \\ \hline 7 = x+8 \\ -8 \quad -8 \\ \hline x = -1 \end{array}$$

$$7 = x+8$$
$$\begin{array}{r} -8 \quad -8 \\ \hline x = -1 \end{array}$$

$$x = -1$$

$$x+7 = -(2x+8)$$

$$2(-5)+8$$

$$-10+8 = -2$$

$$x+7 = -2x-8$$
$$\begin{array}{r} +2x \quad +2x \\ \hline 3x+7 = -8 \\ -7 \quad -7 \\ \hline 3x = -15 \\ \frac{3x}{3} = \frac{-15}{3} \end{array}$$

$$3x+7 = -8$$

$$\begin{array}{r} -7 \quad -7 \\ \hline 3x = -15 \\ \frac{3x}{3} = \frac{-15}{3} \end{array}$$

$$\frac{3x}{3} = \frac{-15}{3}$$

$$\cancel{x = -5}$$

$$|5x-1| + 7 = 3x$$

$$\quad -7 \quad -7$$

$$|5x-1| = \textcircled{3x-7}$$



$$5x-1 = 3x-7$$

$$5x-1 = -(3x-7)$$

$$5x-1 = 3x-7$$
$$-3x+1 \quad -3x+1$$

$$5x-1 = -3x+7$$
$$+3x+1 \quad +3x+1$$

$$\frac{2x}{2} = \frac{-6}{2}$$
$$\boxed{x = -3}$$

$$\frac{8x}{8} = \frac{8}{8}$$

$$\boxed{x = 1}$$

No solution NS