$$\pi^{x-5} = 3^{x+4}$$

$$\log_3\left(\pi^{x-5}\right) = \log_3\left(3^{x+4}\right)$$

$$(x-5)\log_3(\pi) = x+4$$

$$(x-5)\,a = x+4$$

$$ax - 5a = x + 4$$

$$ax - x = 4 + 5a$$

$$x(a-1) = 5a + 4$$

$$x = \frac{5a+4}{a-1}$$

$$x = \frac{5\log_3(\pi)+4}{\log_3(\pi)-1}$$

$$= \frac{5\frac{\ln(\pi)}{\ln(3)}+4}{\frac{\ln(\pi)}{\ln(3)}-1}$$

$$2\cdot\pi^{x-5} = 7\cdot 3^{x+4}$$

$$\log_\pi\left(\pi^{x-5}\right) = \log_\pi\left(3^{x+4}\right)$$

$$x-5 = (x+4)\log_\pi(3)$$

$$x-5 = (x+4)\,b$$

$$x-5 = bx+4b$$

$$x-bx = 4b+5$$

$$x(1-b) = 4b+5$$

$$x = \frac{4b+5}{1-b}$$

$$= \frac{4\log_\pi(3)+5}{1-\log_\pi(3)}$$

$$\frac{4\frac{\ln(3)}{\ln(\pi)}+5}{1-\frac{\ln(3)}{\ln(\pi)}}$$

$$|7-3x| \geq 8$$

$7-3x \geq 8$ OR $7-3x \leq -8$

$-7 \quad = -7$

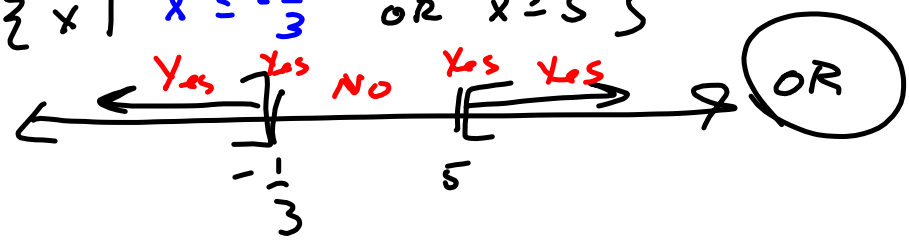
$-3x \geq 1$ OR $-3x \leq -15$

$x \geq \frac{-15}{-3} = 5$

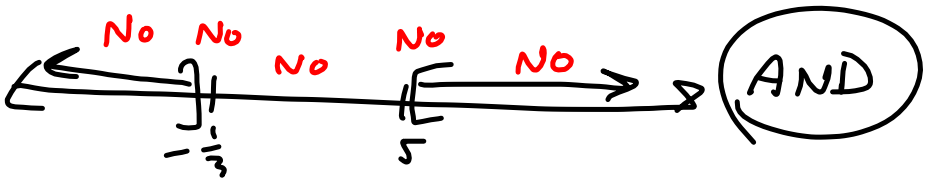
$\frac{-3x}{-3} \leq -\frac{1}{3}$

$\leq$

$\{x \mid x \leq -\frac{1}{3}$ OR $x \geq 5\}$



$= (-\infty, -\frac{1}{3}] \cup [5, \infty)$



$= \emptyset$

S' 5.2 #17

Left to right.
Top to bottom.

E1 $2x+y-2z=-15$

E2 $4y-2y+z=15$

E3 $x+3y+2z=-5$

$-2E1$ $-4x-2y+4z=30$

$+E2$ $4x-2y+z=15$

$-4y+5z=45$

$E1$ $2x+y-2z=-15$

$-2E3$ $-2x-6y-4z=10$

$-5y-6z=-5$

$E1$ $-4y+5z=45$

$E2$ $-5y-6z=-5$

$-5E1$ $20y-25z=-225$

$4E2$ $-20y-24z=-20$

$-49z=-245$

$z=\frac{-245}{-49}=\frac{35}{7}=5=z$

$-5y-6(5)=-5$

$-5y-30=-5$

$-5y=25$

$y=-5$

$E1$ $2x+y-2z=-15$

$2x-5-2(5)=-15$

$2x-15=-15$

$2x=0$

$\frac{2x}{2}=\frac{0}{2}=0=x$

$$2 \cdot \pi^{x-5} = 7 \cdot 3^{x+4}$$

$\ln\left(2 \cdot \pi^{x-5}\right) = \ln\left(7 \cdot 3^{x+4}\right)$

$\ln(2) + \ln(\pi^{x-5}) = \ln(7) +$

options!

$\log_\pi(\text{LHS}) = \log_\pi(\text{RHS})$

$\log_3(\text{LHS}) = \log_3(\text{RHS})$

my fave $\ln(\text{LHS}) = \ln(\text{RHS})$

$\log(\text{LHS}) = \log(\text{RHS})$

S 5.2 #71

$10.36 paid for lunch

232 coins !?

pennies, nickels & dimes

Let x = # of pennies
y = " " nickels
z = " " dimes

# of nickels plus the # of dimes is the # of pennies.

1 $y + z = x$

$10.36 paid for lunch

2 $.01x + .05y + .10z = 10.36$

232 coins

3 $x + y + z = 232$

$$\begin{aligned} &① \quad x - y - z = 0 \\ 100\,&② \quad x + 5y + 10z = 1036 \\ &③ \quad x + y + z = 232 \end{aligned}$$

$$\begin{aligned} &① \quad x - y - z = 0 \\ -\,&③ \quad -x - y - z = -232 \\ &\hline \\ &\quad -2y - 2z = -232 \end{aligned}$$

$$\begin{aligned} &① \quad x - y - z = 0 \\ -\,&② \quad -x - 5y - 10z = -1036 \\ &\hline \\ &\quad -6y - 11z = -1036 \end{aligned}$$

$$\begin{aligned} &① \quad -2y - 2z = -232 \\ &② \quad -6y - 11z = -1036 \end{aligned}$$

$$\begin{aligned} -3\,&① \quad 6y + 6z = 696 \\ &② \quad -6y - 11z = -1036 \\ &\hline \\ &\quad -5z = -340 \\ &\quad z = \frac{-340}{-5} \\ &\quad \boxed{z = 68} \end{aligned}$$

$$\begin{aligned} &① \quad -2y - 3(68) = -232 \\ &\quad -2y - 204 = -232 \\ &\quad -2y = -28 \\ &\quad \boxed{y = 14} \end{aligned}$$

68 is what one person got. Arturo

$$\begin{aligned} &x - y - z = 0 \\ &x - 14 - 68 = 0 \\ &x - 82 = 0 \\ &x = 82 \end{aligned}$$

$82 + 5(14) + 10(68)$

$= 82 + 70 + 680$

$= 152 + 680$

$= 832$

Brenna

116 pennies seems to be correct.

$1680 - 152 = 832$