

①

$$4^{(x+7)} = 8$$

$$\Rightarrow \ln(4^{(x+7)}) = \ln(8)$$

$$\Rightarrow (x+7) \cdot \ln(4) = \ln(8)$$

$$\Rightarrow x \cdot \ln(4) + 7 \ln(4) = \ln(8)$$

$$\Rightarrow x \cdot \ln(4) = \ln(8) - 7 \ln(4)$$

$$\Rightarrow x = \frac{(\ln(8) - 7 \ln(4))}{(\ln(4))}$$

$$\approx \boxed{-5.5}$$

$$\textcircled{2} \quad 27^{(5-2x)} = 13$$

$$\Rightarrow \ln(27^{(5-2x)}) = \ln(13)$$

$$\Rightarrow (5-2x) \ln(27) = \ln(13)$$

$$\Rightarrow 5 \ln(27) - 2x \ln(27) = \ln(13)$$

$$\Rightarrow -2x \ln(27) = \ln(13) - 5 \ln(27)$$

$$\Rightarrow x = \frac{(\ln(13) - 5 \ln(27))}{(-2 \ln(27))}$$

$$\approx \boxed{2.11}$$

$$\textcircled{3}. 9.7^{(6.3x-5.7)} = 48.8$$

$$\Rightarrow \ln(9.7^{(6.3x-5.7)}) = \ln(48.8)$$

$$\Rightarrow (6.3x-5.7) \cdot \ln(9.7) = \ln(48.8)$$

$$\Rightarrow 6.3x \cdot \ln(9.7) - 5.7 \ln(9.7) = \ln(48.8)$$

$$\Rightarrow 6.3x \ln(9.7) = \ln(48.8) + 5.7 \ln(9.7)$$

$$\Rightarrow x = \frac{(\ln(48.8) + 5.7 \ln(9.7))}{(6.3 \ln(9.7))}$$

$$\approx \boxed{1.18}$$

$$\textcircled{4}. 9e^{(2x-3)} - 7 = 10$$

$$\Rightarrow 9e^{(2x-3)} = 17$$

$$\Rightarrow e^{(2x-3)} = 17/9$$

$$\Rightarrow \ln(e^{(2x-3)}) = \ln(17/9)$$

$$\Rightarrow 2x-3 = \ln(17/9)$$

$$\Rightarrow 2x = \ln(17/9) + 3$$

$$\Rightarrow x = \frac{(\ln(17/9) + 3)}{2}$$

$$\approx \boxed{1.82}$$

$$(5) 6.2 e^{(.5x)} - 2.7 = 14.9$$

$$\Rightarrow 6.2 e^{(.5x)} = 17.6$$

$$\Rightarrow e^{(.5x)} = 17.6/6.2$$

$$\Rightarrow \ln(e^{(.5x)}) = \ln(17.6/6.2)$$

$$\Rightarrow .5x = \ln(17.6/6.2)$$

$$\Rightarrow x = \boxed{\frac{(\ln(17.6/6.2))}{(.5)}}$$

$$\approx \boxed{2.09}$$

$$(6) (-.005) e^{(x/35.1)} = -16.61$$

$$\Rightarrow e^{(x/35.1)} = \frac{-16.61}{-.005}$$

$$\Rightarrow \ln(e^{(x/35.1)}) = \ln\left(\frac{-16.61}{-.005}\right)$$

$$\Rightarrow \frac{x}{35.1} = \ln\left(\frac{-16.61}{-.005}\right)$$

$$\Rightarrow x = \boxed{35.1 \cdot \ln\left(\frac{-16.61}{-.005}\right)}$$

$$\approx \boxed{284.60}$$

$$(7) \quad 5^{(x+2)} = 18^{(2x-5)}$$

$$\Rightarrow \ln(5^{(x+2)}) = \ln(18^{(2x-5)})$$

$$\Rightarrow (x+2)\ln(5) = (2x-5)(\ln(18))$$

$$\Rightarrow x\ln(5) + 2\ln(5) = 2x\ln(18) - 5\ln(18)$$

$$\Rightarrow x\ln(5) - 2x\ln(18) = -5\ln(18) - 2\ln(5)$$

$$\Rightarrow x = \frac{(-5\ln(18) - 2\ln(5))}{(\ln(5) - 2\ln(18))}$$

$$\approx \boxed{4.24}$$

$$(8) \quad 22^{(7-x)} = 11.4^{(3x+1)}$$

$$\Rightarrow \ln(22^{(7-x)}) = \ln(11.4^{(3x+1)})$$

$$\Rightarrow (7-x)\ln(22) = (3x+1)\ln(11.4)$$

$$\Rightarrow 7\ln(22) - x\ln(22) = 3x\ln(11.4) + \ln(11.4)$$

$$\Rightarrow -x\ln(22) - 3x\ln(11.4) = +\ln(11.4) - 7\ln(22)$$

$$\Rightarrow x = \frac{(\ln(11.4) - 7\ln(22))}{(-\ln(22) - 3\ln(11.4))}$$

$$\approx \boxed{1.85}$$

$$9) 12.04^{(.8x)} = 1.4^{(2.2x-1)}$$

$$\Rightarrow \ln(12.04^{(.8x)}) = \ln(1.4^{(2.2x-1)})$$

$$\Rightarrow (.8x) \cdot \ln(12.04) = (2.2x-1) \cdot \ln(1.4)$$

$$\Rightarrow .8x \ln(12.04) = 2.2x \ln(1.4) - \ln(1.4)$$

$$\Rightarrow .8x \ln(12.04) - 2.2x \ln(1.4) = -\ln(1.4)$$

$$\Rightarrow x = \frac{(-\ln(1.4))}{(.8 \ln(12.04) - 2.2 \ln(1.4))}$$

$$\approx \boxed{-0.27}$$

$$10) e^{2x} - 5e^x - 18 = 0$$

$$\Rightarrow (e^x)^2 - 5(e^x) - 18 = 0$$

$$\text{Let } u = e^x$$

$$\Rightarrow u^2 - 5u - 18 = 0$$

$$\Rightarrow u = \frac{-(-5) \pm \sqrt{(-5)^2 - 4(1)(-18)}}{2(1)}$$

$$= \frac{5 \pm \sqrt{25 + 72}}{2}$$

$$= \frac{5 \pm \sqrt{97}}{2}$$

$$u = \frac{(5 + \sqrt{97})}{2} \text{ OR } u = \frac{(5 - \sqrt{97})}{2}$$

$$u \approx 7.42 \text{ OR } u = -2.42$$

so from the 1st statement

$$u = e^x$$

$$\Rightarrow 7.42 = e^x \text{ OR } -2.42 = e^x$$

$$\Rightarrow \ln(7.42) = \ln(e^x) \Rightarrow \ln(-2.42) = \ln(e^x)$$

$$\Rightarrow \ln(7.42) = x \Rightarrow \ln(-2.42) = x$$

$$\Rightarrow \boxed{x \approx 2.00}$$

NO
VALUES

Pg 61x

$$(11). 3e^{2x} + 22.1e^x + 1.4 = 0$$

$$\Rightarrow 3(e^x)^2 + 22.1(e^x) + 1.4 = 0$$

$$\text{Let } u = e^x$$

$$\Rightarrow 3u^2 + 22.1u + 1.4 = 0$$

$$\Rightarrow u = \frac{-(22.1) \pm \sqrt{(22.1)^2 - 4(3)(1.4)}}{2(3)}$$

$$= \frac{-22.1 \pm \sqrt{471.61}}{6}$$

$$= \frac{-22.1 \pm 21.72}{6}$$

$$\Rightarrow u = \frac{-22.1 + 21.72}{6} \quad \text{or } u = \frac{-22.1 - 21.72}{6}$$

$$= -0.063 \quad \text{or } = -7.303$$

so from the let statement

$$-0.063 = e^x$$

$$\Rightarrow \cancel{h(-0.063) = h(e^x)} \quad \text{or} \quad \Rightarrow \cancel{h(-7.303) = h(e^x)}$$

$\Downarrow$
 NO
SOLUTION

$$-7.303 = e^x$$

$$\Rightarrow \cancel{h(-7.303) = h(e^x)}$$

$\Downarrow$
 NO
SOLUTION

so ~~NO SOLUTION~~
NO SOLUTION

$$(12) \quad (.6)e^{2x} + 3e^{(x+2)} - 1.1 = 0$$

$$\Rightarrow (.6)(e^x)^2 + 3 \cdot e^x \cdot e^2 - 1.1 = 0$$

$$\Rightarrow .6(e^x)^2 + 3e^2(e^x) - 1.1 = 0$$

$$\text{Let } u = e^x$$

$$\Rightarrow .6u^2 + (3e^2)u - 1.1 = 0$$

$$u = \frac{-(3e^2) \pm \sqrt{(3e^2)^2 - 4(.6)(1.1)}}{2(.6)}$$

$$= \frac{-3e^2 \pm \sqrt{488.74}}{1.2}$$

$$\Rightarrow u = \frac{-3e^2 + \sqrt{488.74}}{1.2} \quad \text{or} \quad u = \frac{-3e^2 - \sqrt{488.74}}{1.2}$$

$$= -.0497 \quad \text{or} \quad = -36.8955$$

$$\Rightarrow -.0497 = e^x$$

$$\Rightarrow h(\cancel{-.0497}) = h(e^x)$$

$$\Rightarrow \text{NO VALUE}$$

$$\Rightarrow -36.90 = e^x$$

$$\Rightarrow h(\cancel{-36.90}) = h(e^x)$$

$$\Downarrow$$

NO
value

SO / NO SOLUTION