

Solving Exponential Equations with Binomial Exponents.

1. $2^{x+6} = 32$

$$\ln 2^{x+6} = \ln 32$$

$$\frac{(x+6) \ln(2)}{\ln(2)} = \frac{\ln(32)}{\ln(2)}$$

$$x+6 = 5$$

$$-6 \quad -6$$

$$x = -1$$

2.) $9^{2x-5} = 27$

$$\ln 9^{2x-5} = \ln 27$$

$$\frac{(2x-5) \ln(9)}{\ln(9)} = \frac{\ln(27)}{\ln(9)}$$

$$2x-5 = 1.5$$

$$+5 \quad +5$$

$$\frac{2x}{2} = \frac{6.5}{2}$$

$$x = 3.25$$

$$3) e^{4x-9} = 56$$

$$\ln e^{4x-9} = \ln 56$$

$$4x - 9 = \ln(56)$$
$$+9 \quad +9$$

$$4x = \ln(56) + 9$$

$$\frac{4x}{4} = \frac{13.03}{4}$$

$$\boxed{x = 3.26}$$

$$4. \quad \cancel{3} + 2^{2x+1} = 15$$
$$\quad \quad \quad -3 \quad \quad \quad -3$$

$$2^{2x+1} = 12$$

$$\frac{(2x+1)\ln 2}{\ln 2} = \frac{\ln(12)}{\ln(2)}$$

$$2x + 1 = 3.58$$

$$\quad -1 \quad \quad -1$$
$$2x = 2.58$$

$$\boxed{x = 1.29}$$

$$5. \frac{3(3^{3x+2})}{3} = \frac{27}{3}$$

$$3^{3x+2} = 9$$

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

$$\frac{3x+2}{-2} = \frac{2}{-2}$$

$$\frac{3x}{3} = \frac{0}{3}$$

$$\boxed{x = 0}$$

#8

$$7^{x+1} = 24$$

$$\frac{x+1 \ln 7}{\ln 7} = \frac{\ln 24}{\ln 7}$$

$$x+1 = 1.63$$

$$x = .63$$

You Try

$$6. 6^{2x+3} - 4 = 32$$

$$x = -1/2$$

$$7. 3^{x-5} = 87$$

$$x = 9.07$$

$$8. 7^{x+1} \cdot 2 = 48$$

$$x = .63$$