

## Exponential Equations – Practice and Answers

Exponential equation can sometimes be solved by exploiting that one-to-one property of exponential functions. For example

$$2^{(4x-3)} = 16$$

We can solve this by first writing both sides of the equation in terms of the same base. We know  $16 = 2^4$  that so re-writing

$$2^{(4x-3)} = 2^4$$

Using the one-to-one property

$$4x - 3 = 4$$

$$4x = 7$$

$$x = \frac{7}{4}$$

Solve each of the following equations by using the one-to-one property of exponential functions.

1)  $2^{2x+1} = 8$

5)  $5^{2x} = 625$

9)  $2^{5x} = 1024$

2)  $5^{2x-1} = 125$

6)  $8^{2x} = 32$

10)  $2^{x^2} \times 3^{x^2} = 36^{x-\frac{1}{2}}$

3)  $3^{2x-1} = 81$

7)  $4^{x^2+2x+1} = 16$

4)  $4^{3x} = 128$

8)  $9^{6x} = 243$

Answers

1)  $x = 1$

2)  $x = 2$

3)  $x = \frac{5}{2}$

4)  $x = \frac{7}{6}$

5)  $x = 2$

6)  $x = \frac{5}{6}$

7)  $x = -1 \pm \sqrt{2}$

8)  $x = \frac{5}{12}$

9)  $x = 2$

10)  $x = 1$