

7.3 Practice Solving Exponential Equations

1) $2^x = 32$

$$2^x = 2^5$$

$$x = 5$$

2) $2^{3x-5} = 16$

$$2^{3x-5} = 2^4$$

$$3x - 5 = 4$$

$$3x = 9$$

$$x = 3$$

3) $5^{4x-7} = 125$

$$5^{4x-7} = 5^3$$

$$4x - 7 = 3$$

$$4x = 10$$

$$x = \frac{10}{4}$$

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

4) $3^{x^2+4x} = \frac{1}{27}$

$$3^{x^2+4x} = 3^{-3}$$

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

$$x^2 + 4x + 3 = 0$$

$$(x+3)(x+1) = 0$$

$$x = -3 \quad x = -1$$

$$5) \frac{1}{27^{x-1}} = 81$$

$$(3^{-3})^{x-1} = 3^4$$

$$3^{-3x+3} = 3^4$$

$$-3x+3 = 4$$

$$-3x = 1$$

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

$$6) \frac{2(5^{2x-9})}{2} = \frac{250}{2}$$

$$5^{2x-9} = 125$$

$$5^{2x-9} = 5^3$$

$$2x-9 = 3$$

$$2x = 12$$

$$x = 6$$

$$7) 3^{3x} = \frac{1}{81}$$

$$3^{3x} = 3^{-4}$$

$$3x = -4$$

$$x = -\frac{4}{3}$$

$$8) 32^{3x-2} = 16$$

$$(2^5)^{3x-2} = 2^4$$

$$2^{15x-10} = 2^4$$

$$15x-10 = 4$$

$$15x = 14$$

$$x = \frac{14}{15}$$