Exponential equations: 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

Write each number as a power of 2.

(a) 8

(b) 64

(c) 1

(d) ¼

Question 2

Solve each equation.

(a) $2^x = 16$

(b) $3^x = 27$

(c) $10^x = 1000$

Question 3

Solve each equation.

(a) $5^x = 1$

(b) $7^x = 7$

Question 4

(a) Copy and complete the table of powers of 3.

x	0	1	2	3	4	5
3^x						

(b) Use the table to solve $3^x = 243$.

Section B: Standard (Questions 5-10)

Question 5

Solve each equation.

(a) 2^(x + 1) = 32

(b) $3^{2x} = 81$

(c) 5^(x - 2) = 125

Question 6

Solve each equation.

(a) $2^x = \frac{1}{8}$

(b) $10^x = 0.01$

(c) $3^x = 1/81$

Question 7

Solve each equation by writing both sides with the same base.

(a) $4^x = 32$

(b) $9^x = 27$

(c) $8^x = 4$

Question 8

Solve each equation.

(a) $2^{3x} = 4^{(x + 1)}$

(b) $9^x = 3^{(x + 4)}$

(c) 25^(x - 1) = 5^(x + 3)

Question 9

Solve each equation.

(a) $3 \times 2^x = 48$

(b) $5^x + 4 = 29$

(c) $2 \times 3^x - 7 = 47$

Question 10

Solve each equation.

(a) $(\frac{1}{2})^x = 1/32$

(b) $(\frac{1}{3})^x = 9$

Exponential equations: answers

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Question 1

Answer: (a) 2^3 (b) 2^6 (c) 2^0 (d) 2^{-2}

Question 2

Answer: (a) x = 4 (b) x = 3 (c) x = 3

Question 3

Answer: (a) x = 0 (b) x = 1

Question 4

Answer: (a) 1, 3, 9, 27, 81, 243 (b) x = 5

Question 5

Answer: (a) x = 4 (x + 1 = 5) (b) x = 2 (2x = 4) (c) x = 5 (x - 2 = 3)

Question 6

Answer: (a) x = -3 (b) x = -2 (c) x = -4

Question 7

Answer: (a) x = 5/2 ($2^{2x} = 2^5$) (b) x = 3/2 ($3^{2x} = 3^3$) (c) x = ⅔ ($2^{3x} = 2^2$). Also accept d ecimals 2.5 and 1.5

Question 8

Answer: (a) x = 2 (3x = 2x + 2) (b) x = 4 (2x = x + 4) (c) x = 5 (2x - 2 = x + 3)

Question 9

Answer: (a) x = 4 ($2^x = 16$) (b) x = 2 ($5^x = 25$) (c) x = 3 ($3^x = 27$)

Question 10

Answer: (a) x = 5 (b) x = -2 ($3^{-x} = 3^2$)