F.LE.A.4: Exponential Equations 2

1 The value of x in the equation $4^{2x+5} = 8^{3x}$ is
1) 1 2) 2 3) 5 4) -10

2 Which value of k satisfies the equation $8^{3k+4} = 4^{2k-1}$?
1) -1 2) $-\frac{9}{4}$ 3) -2 4) $-\frac{14}{5}$

3 What is the value of b in the equation $4^{2b-3} = 8^{1-b}$?
1) $\frac{-3}{7}$ 2) $\frac{7}{9}$ 3) $\frac{9}{7}$ 4) $\frac{10}{7}$

4 The solution of $8^{1-p} = 16^{2p-1}$ is
1) $\frac{7}{11}$ 2) $\frac{3}{5}$ 3) $\frac{4}{9}$ 4) $\frac{2}{5}$

5 Solve for x: $64^{x-2} = 256^{2x}$
1) $\frac{-6}{11}$ 2) $\frac{-6}{5}$ 3) $\frac{-1}{5}$ 4) 0

6 Solve algebraically for x: $8^{2x} = 4^6$

7 Solve for x: $4^{2x+1} = 8^{2x}$

8 Solve for x: $4^x = 8^{x-1}$

9 If $8^{x+1} = 4^{2x}$, what is the value of x?

10 Solve for x: $4^{3x+1} = 8^{4x}$

11 Solve for x: $32^x = 4^{(2x+1)}$

12 Solve for x: $16^{x+4} = 32^{2x-10}$

13 Solve algebraically for x: $16^{2x+3} = 64^{x+2}$

14 Solve for x: $8^{x+3} = 32^{x^2-1}$

F.LE.A.4: Exponential Equations 2
Answer Section

1 ANS: 2

$$4^{2x+5} = 8^{3x}$$

$$\left(2^2\right)^{2x+5} = \left(2^3\right)^{3x}$$

$$2^{4x+10} = 2^{9x}$$

$$4x + 10 = 9x$$

$$10 = 5x$$

$$2 = x$$

REF: 061105a2

2 ANS: 4

$$8^{3k+4} = 4^{2k-1}$$

$$(2^3)^{3k+4} = (2^2)^{2k-1}$$

$$2^{9k+12} = 2^{4k-2}$$

$$9k + 12 = 4k - 2$$

$$5k = -14$$

$$k = -\frac{14}{5}$$

REF: 011309a2

3 ANS: 3

$$4^{2b-3} = 8^{1-b}$$

$$\log 4^{2b-3} = \log 8^{1-b}$$

$$(2b-3)\log 4 = (1-b)\log 8$$

$$\frac{2b-3}{1-b} = \frac{\log 8}{\log 4}$$

$$\frac{2b-3}{1-b} = \frac{3}{2}$$

$$4b - 6 = 3 - 3b$$

$$7b = 9$$

$$b = \frac{9}{7}$$

$$4^{2b-3} = 8^{1-b}$$

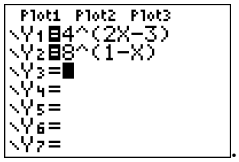
$$(2^2)^{2b-3} = (2^3)^{1-b}$$

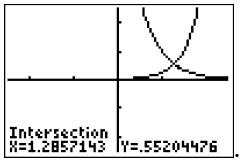
$$2^{4b-6} = 2^{3-3b}$$

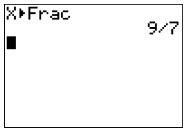
$$4b - 6 = 3 - 3b$$

$$7b = 9$$

$$b = \frac{9}{7}$$







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4 ANS: 1

$(2^3)^{1-p} = (2^4)^{2p-1}$

$3 - 3p = 8p - 4$

$7 = 11p$

$\frac{7}{11} = p$

REF: 061611a2

5 ANS: 2

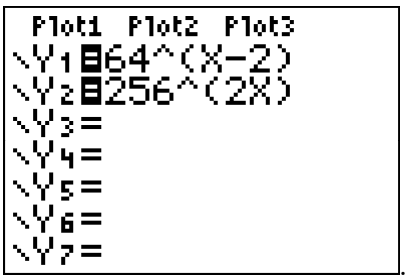
$64^{x-2} = 256^{2x}$

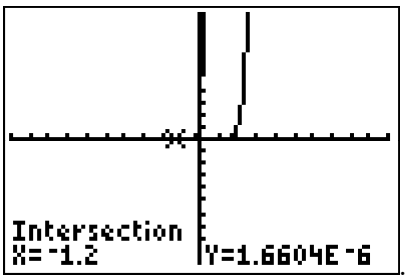
$(2^6)^{x-2} = (2^8)^{2x}$

$2^{6x-12} = 2^{16x}$

$6x - 12 = 16x$

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





$-1.2 = \frac{-6}{5}$

REF: fall9907b

6 ANS:

$8^{2x} = 4^6$

$\log 8^{2x} = \log 4^6$

2. $2x \cdot \log 8 = 6 \log 4$

$x = \frac{6 \log 4}{2 \log 8}$

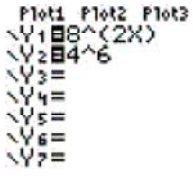
$x = 2$

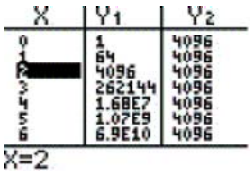
$8^{2x} = 4^6$

$(2^3)^{2x} = (2^2)^6$

$6x = 12$

$x = 2$





REF: 010626b

7 ANS:
1

REF: 088705siii

8 ANS:
3

REF: 069506siii

9 ANS:
3

REF: 069905siii

10 ANS:
$\frac{1}{3}$

REF: 080309siii
11 ANS:
2

REF: 089913siii
12 ANS:
11

REF: 010409siii
13 ANS:
$16^{2x+3} = 64^{x+2}$

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

$4x + 6 = 3x + 6$

$x = 0$

REF: 011128a2
14 ANS:
$\left(2^3\right)^{x+3} = \left(2^5\right)^{x^2-1}$

$3x + 9 = 5x^2 - 5$

$0 = 5x^2 - 3x - 14$

$0 = (5x + 7)(x - 2)$

$x = -\frac{7}{5}, 2$

REF: 081636a2