

A2.A.27: Exponential Equations 2: Solve exponential equations with and without common bases

- 1 The solution set of $2^{x^2+2x} = 2^{-1}$ is
- 2 The solution set of $4^{x^2+4x} = 2^{-6}$ is
- 3 The solution set of $2^{x+1} = 8$ is
- 4 If $2^{4x+1} = 8^{x+a}$, which expression is equivalent to x ?
- 5 The solution set of the equation $3^{x^2+x} = 9$ is
- 6 Determine the value of x and y if $2^y = 8^x$ and $3^y = 3^{x+4}$.
- 7 If $2^{(16x^2-8x-3)} = 1$, what does x equal?
- 8 What is the value of x in the equation $3^{x-3} = 1$?
- 9 If $0^\circ < \theta < 360^\circ$, the solutions of the equation $9^{\sin \theta} = 3$ are 30° and

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Answer Section

- 1 ANS:
{-1}

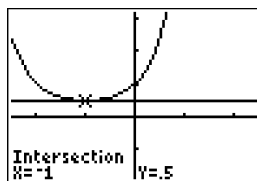
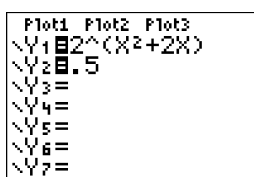
$$2^{x^2+2x} = 2^{-1}$$

$$x^2 + 2x = -1$$

$$x^2 + 2x + 1 = 0$$

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

$$x = -1$$



PTS: 2 REF: 060612b

- 2 ANS:
{-1, -3}

$$4^{x^2+4x} = 2^{-6} \quad 2x^2 + 8x = -6$$

$$(2^2)^{x^2+4x} = 2^{-6} \quad 2x^2 + 8x + 6 = 0$$

$$2^{2x^2+8x} = 2^{-6} \quad x^2 + 4x + 3 = 0$$

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

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

PTS: 2 REF: 061015a2

- 3 ANS:
{2}

PTS: 2 REF: 019916siii

- 4 ANS:
 $3a - 1$

$$2^{4x+1} = 8^{x+a}$$

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

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

$$4x+1 = 3x+3a$$

$$x = 3a - 1$$

PTS: 2 REF: 060814b

- 5 ANS:
{-2, 1}

PTS: 2 REF: 010222siii

6 ANS:

$$x = 2, y = 6$$

$$2^y = 8^x$$

$$2^y = (2^3)^x$$

$$y = 3x$$

$$3x = x + 4$$

$$x = 2$$

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

$$y = x + 4$$

$$y = x + 4$$

$$y = 2 + 4 = 6$$

PTS: 2

REF: 080118b

7 ANS:

$$-\frac{1}{4} \text{ and } \frac{3}{4}$$

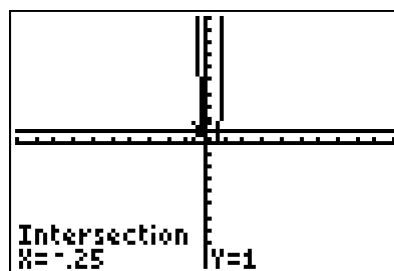
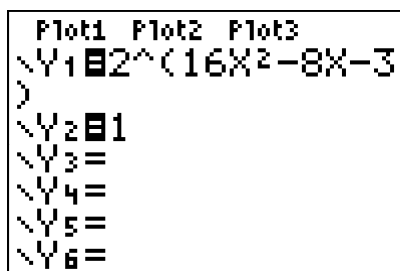
$$2^{(16x^2 - 8x - 3)} = 1$$

$$2^{(16x^2 - 8x - 3)} = 2^0$$

$$16x^2 - 8x - 3 = 0$$

$$(4x + 1)(4x - 3) = 0$$

$$x = -\frac{1}{4} \quad x = \frac{3}{4}$$



PTS: 2

REF: 080819b

8 ANS:

$$3$$

PTS: 2

REF: 089819siii

9 ANS:

$$150^\circ$$

PTS: 2

REF: 010325siii