

## 1 ID 5 Completing the Square

1. Which of the following expressions is an expansion of  $(x + 4)^2$ ?
  - (a)  $x^2 + 16$
  - (b)  $x^2 + 8x + 16$  \*
  - (c)  $x^2 + 4x + 16$
  - (d) I don't know yet.
2. Which of the following expressions is an expansion of  $(2x - 3)^2$ ?
  - (a)  $4x^2 - 12x + 9$  \*
  - (b)  $4x^2 - 9$
  - (c)  $2x^2 - 12x + 9$
  - (d)  $4x^2 - 12x - 9$
  - (e) I don't know yet.
3. Which of the expressions below is equivalent to  $x^2 - 10x + 25$ ?
  - (a)  $(x - 5)^2$  \*
  - (b)  $(x + 5)^2$
  - (c)  $(x + 5)^2 + 20$
  - (d)  $(x - 5)^2 + 20$
  - (e) I don't know yet.
4. Which of the expressions below is equivalent to  $x^2 - 6x + 34$ ?
  - (a)  $(x - 6)^2$
  - (b)  $(x - 3)^2$
  - (c)  $(x - 3)^2 + 5^2$  \*
  - (d)  $(x - \sqrt{34})^2$
  - (e) I don't know yet.

## 2 ID10 Solving Linear Equations

1. What is the value for  $x$ , if  $3x = 21$ ?
  - (a)  $x = 7$  \*
  - (b)  $x = \frac{3}{21}$
  - (c)  $x = 18$
  - (d)  $x = -7$
  - (e) I don't know yet.
2. What is the value for  $x$ , if  $-4x = 12$ ?
  - (a)  $x = 3$
  - (b)  $x = -3$ \*
  - (c)  $x = 8$
  - (d)  $x = 16$
  - (e) I don't know yet.
3. What is the correct value for  $x$ , if  $3 - x = 7$ ?
  - (a)  $x = 10$
  - (b)  $x = \frac{-7}{3}$
  - (c)  $x = 4$
  - (d)  $x = -4$ \*
  - (e) I don't know yet.
4. What is the correct value for  $x$ , if  $3x - 2 = 13$ ?
  - (a)  $x = 15$
  - (b)  $x = 5$  \*
  - (c)  $x = -5$
  - (d)  $x = \frac{11}{3}$
  - (e) I don't know yet.
5. What is the correct value of  $x$ , if  $3x = \frac{5}{2}$ ?
  - (a)  $x = \frac{15}{2}$
  - (b)  $x = \frac{5}{2}$
  - (c)  $x = -\frac{1}{2}$
  - (d)  $x = \frac{5}{6}$  \*
  - (e) I don't know yet.

### 3 ID11 Linear Equations Involving Fractions

1. What is the **lowest common denominator** in the following equation?

$$\frac{x}{6} - \frac{x}{2} = 5$$

- (a) 12
  - (b) 6 \*
  - (c) 30
  - (d) I don't know yet.
2. Which of the following is correct next step in solving the equation?

$$\frac{x}{6} - \frac{x}{2} = 5$$

- (a)  $2x - 6x = 5$
  - (b)  $2x - 6x = 60$  \*
  - (c)  $2x - 6x = 30$
  - (d)  $x - 3x = 30$  \*
  - (e) I don't know yet.
3. What is appropriate next step in solving the equation

$$\frac{x-1}{4} + \frac{2x}{3} = \frac{5}{2}$$

- (a)  $3(x - 1) + 4(2x) = 6(5)$ \*
- (b)  $3(x - 1) + 4(2x) = 12(5)$
- (c)  $6(x - 1) + 8(2x) = 12(5)$ \*
- (d)  $3(x - 1) + 4(2x) = \frac{5}{2}$
- (e) I don't know yet.

### 4 ID 13 Quadratic Equations Derived from Fractions

1. What is the **lowest common denominator** of the following equation:

$$\frac{2}{x} = \frac{3}{x+2} - \frac{5}{x^2}$$

- (a)  $(x)(x + 2)(x^2)$
- (b)  $(x + 2)(x^2)$  \*
- (c)  $(x)(x + 2)$
- (d) I don't know yet.

2. What is appropriate next step in solving the equation:

$$\frac{3}{x+1} + \frac{1}{x-1} = 2$$

- (a)  $3(x-1) + 1(x+1) = 2$   
(b)  $3(x+1) + 1(x-1) = 2(x+1)(x-1)$   
(c)  $3(x-1) + 1(x+1) = 2(x+1)(x-1)$  \*  
(d) I don't know yet.
3. What is appropriate next step in solving the equation:

$$\frac{10}{x-1} + \frac{12}{x+2} = \frac{7}{2}$$

- (a)  $(2)(x+2)(10) + (12)(x-1)(2) = (7)(x-1)(x+2)$  \*  
(b)  $10(x+2) + 12(x-1) = \frac{7}{2}$   
(c)  $10(x-1) + 12(x+2) = \frac{7}{2}$   
(d) I don't know yet.

## 5 ID 25 Equations with $x$ as an Index: Quadratic Substitution, where $x \in \mathbb{Q}$

1. If  $y = 2^x$ , express  $2^{2x}$  in terms of  $y$ :

- (a)  $2y$   
(b)  $4y$   
(c)  $y^2$  \*  
(d)  $y + 4$   
(e) I don't know yet.

2. If  $y = 3^x$ , express  $3^{x+2}$  in terms of  $y$ :

- (a)  $y^2$   
(b)  $9y$  \*  
(c)  $2y$   
(d)  $y + 2$   
(e) I don't know yet.

3. If  $y = 2^x$ , express the equation  $2^{x+1} + 2^{-x} + 3 = 0$  in terms of  $y$ .

- (a)  $2y + \frac{1}{y} + 3 = 0$  \*  
(b)  $y + 1 + \frac{1}{y} + 3 = 0$   
(c)  $2y - y + 3 = 0$   
(d)  $y^2 - y + 3 = 0$   
(e) I don't know yet.

## 6 ID 27 Logarithmic Equations: Same Base

1. Which of the equations below is appropriate considering:

$$\log_2(3x + 1) = 2$$

- (a)  $4 = 3x + 1$  \*
- (b)  $3x + 1 = 2$
- (c)  $6x + 2 = 2$
- (d) I don't know yet.

2. Which of the following equations is appropriate considering:

$$\log_2(x - 2) + \log_2(x) = 3$$

- (a)  $x - 2 + x = 3$
- (b)  $x^2 - 2x = 3$
- (c)  $x^2 - 2x = 8$  \*
- (d)  $x - 2 + x = 8$
- (e) I don't know yet.

3. Which of the equations below is appropriate considering:

$$\log(5x + 3) - \log(2) = 2\log(x)$$

- (a)  $5x + 3 - 2 = 2x$
- (b)  $\frac{5x+3}{2} = 2x$
- (c)  $5x + 3 - 2 = x^2$
- (d)  $\frac{5x+3}{2} = x^2$  \*
- (e) I don't know yet.

## 7 ID 28 Logarithmic Equations Change of Base: Linear Format

1. What is the correct use of the change of base formula to advance the following equation:

$$\log_5(2x + 1) + \log_{125}(2x + 1) = 16$$

- (a)  $\log_5(2x + 1) + \frac{\log_5(2x+1)}{\log_5 125} = 16$  \*
- (b)  $\log_5(2x + 1) + \frac{\log_5 125}{\log_5(2x+1)} = 16$
- (c)  $\frac{\log_{125} 5}{\log_{125}(2x+1)} + \log_{125}(2x + 1) = 16$
- (d) I don't know yet.

2. What is an appropriate simplification of the following equation:

$$\log_2(x - 1) - 2\log_2(x - 1) = -3$$

- (a)  $\log_2(x - 1) = 3$  \*
- (b)  $-2\log_2(x - 1)^2 = -3$
- (c)  $\log_2(x - 1) = -3$
- (d) I don't know yet.

## 8 ID 24 Equations with $x$ as an index, where $x \in R$

1. What does  $x$  equal if

$$2^x = 17$$

?

- (a)  $x = \frac{17}{2}$
  - (b)  $x = \log_2 17$  \*
  - (c)  $x = \log_{17} 2$
  - (d)  $x = 15$
  - (e) I don't know yet.
2. What is the correct value for  $x$  if  $3^{x-2} = 100$ ?
- (a)  $x = \log_3(100) + 2$  \*
  - (b)  $x = \log_3(100) - 2$
  - (c)  $x = \log_3(102)$
  - (d)  $x = \log_3(98)$
  - (e) I don't know yet.
3. What is the correct value for  $x$  if  $5^{3x} = 250$ ?
- (a)  $x = \frac{250}{15}$
  - (b)  $x = \frac{\log_3 250}{5}$
  - (c)  $x = \frac{\log_5 250}{3}$  \*
  - (d)  $x = \frac{\log_{250} 5}{3}$
  - (e) I don't know yet.

## 9 ID 26 Equations with $x$ as an index: Quadratic Substitution where $x \in R$

1. If  $y = 2^x$ , express  $2^{2x}$  in terms of  $y$ .

- (a)  $2y$
- (b)  $4y$

- (c)  $y^2$  \*
- (d)  $y + 4$
- (e) I don't know yet.
2. If  $y = 3^x$ , express the equation  $3^{2x} + 3^{x+1} - 4 = 0$  in terms of  $y$ .
- (a)  $y^2 + 3y - 4 = 0$  \*
- (b)  $2y + y + 1 - 4 = 0$
- (c)  $9y + 3y - 4 = 0$
- (d)  $y^2 + y + 1 - 4 = 0$
- (e) I don't know yet.
3. If  $3^x = 4$ , what is correct procedure for finding  $x$ ?
- (a)  $x = \frac{4}{3}$
- (b)  $x = 4 - 3$
- (c)  $x = \log_3 4$  \*
- (d)  $x = \log_4 3$
- (e) I don't know yet.
4. If  $2^x = -8$ , what is  $x$ ?
- (a)  $x = \frac{-8}{2}$
- (b)  $x = -3$
- (c)  $x = \log_2 8$
- (d) No solution \*
- (e) I don't know yet.

## 10 ID29 Logarithmic Equations: Change of bases, Quadratic Format.

1. What is an appropriate use of the change of base formula to proceed in solving the following equation:

$$\log_2 x - \log_x 16 + 3 = 0$$

- (a)  $\log_2 x - \frac{\log_2 x}{\log_2 16} + 3 = 0$
- (b)  $\log_2 x - \frac{\log_2 16}{\log_2 x} + 3 = 0$  \*
- (c)  $\frac{\log_x 2}{\log_x x} - \log_x 16 + 3 = 0$
- (d) I don't know yet.
2. What is the correct value for  $x$  if:

$$\log_2 x = 3$$

- (a)  $x = 4$
- (b)  $x = 3$
- (c)  $x = \frac{3}{2}$
- (d)  $x = 8^*$