Backsolving

1. Which of the following is a solution to the equation $3(x-1)^2 + 2x - 2 = 0$?

   A. $x = -1$

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

   C. $x = 0$

   D. $x = \frac{1}{3}$

   E. $x = 2$

2. As part of her architecture homework, Suzanne found the area and perimeter of her dorm room. She found that the area of her rectangular dorm room was 432 feet and the perimeter was 84 feet. Before turning in her assignment, she realized that she did not write down the dimensions of the room. What are the dimensions of Suzanne's living room, in feet?

   A. 12×32

   B. 12×36

   C. 16×27

   D. 18×24

   E. 24×60

3. Which of the following (x, y) pairs is a solution to the equations $x + y = 3$ and $3x + 2y = 7$?

   A. $(1, 1)$

   B. $(1, 2)$

   C. $(2, 1)$

   D. $(2, 2)$

   E. $(3, 2)$

4. What real value of x satisfies the equation $\log_6(36^3) = 2x$?

   A. 3

   B. 6

   C. 12

   D. 36

   E. 216

5. The depth of a swimming pool is 8 feet and is being reduced by 2 inches per day. The depth of a second swimming pool is 7 feet and is being reduced by 1 inch per day. If the depths of both swimming pools continue to be reduced at these constant rates, in approximately how many days will the pools have the same depths?

A. 1
B. 6
C. 8
D. 12
E. 14

6.
$$\sqrt{x} = x - 2$$

What are all values of x that satisfy the above equation?

          I. 1
        II. 4

A. I only
B. II only
C. I and II
D. Neither I nor II

7.
$$\sqrt{x - 5} = 5 - \sqrt{x}$$

If x is the solution to the equation above, what is the value of $\sqrt{x - 5}$?

A. $\sqrt{\dfrac{5}{2}}$

B. 2

C. $\sqrt{5}$

D. 5

E. 9

8. A function $f(x)$ is defined as $f(x) = 4^{x^2 - 2x - 3}$. What 2 real numbers satisfy $f(x) = 1$?

A. -3 and 3
B. -3 and 0
C. -1 and 3
D. -1 and 0
E. 0 and 2

9. A bag contains 44 blue marbles, 36 purple marbles, and 18 white marbles. How many blue marbles must be subtracted from the 98 marbles already in the bag so that the probability of randomly drawing a blue marble is $\frac{4}{13}$?
    A. 10
    B. 15
    C. 20
    D. 25
    E. 30

10. For what value of x is the equation $\sqrt{x} + \sqrt{16} = \sqrt{49}$ true?
    A. 2
    B. 3
    C. 4
    D. 9
    E. 36

11. The list of numbers $43, 39, 35, A, B,$ and 16 has a median of 30. The mode of the list of numbers is 16. To the nearest whole number, what is the mean of the list?
    A. 25
    B. 28
    C. 29
    D. 30
    E. 35

12. The ESM office auditorium has 216 seats, which are all arranged in rows. The number of seats in each row is 6 less than the number of rows. How many rows of seats are in the auditorium?
    A. 9
    B. 12
    C. 18
    D. 36
    E. 54

13. What are all and only the values of x that are NOT in the domain of the function $f(x) = \frac{(x+6)(x-2)}{(x+4)(x-7)}$?
   A. -7 and 4
   B. -4 and 7
   C. -6 and 2
   D. $-7, -2, 4,$ and 6
   E. $-6, -4, 2,$ and 7

14. Which of the following is a solution to the equation $\sqrt{3x - 27} + 3 = x$?

   I. -3
   II. 1
   III. 6

   A. I only
   B. II only
   C. III only
   D. I and II
   E. None of the above

15. $$\frac{x-2}{2} = \frac{x+2}{3}$$

   What is the solution to the equation shown above?
   A. -2
   B. 0
   C. 2
   D. 3
   E. 10

16. $$b(-5x - 1) + x = 11x - 3$$

   The equation above has no solutions, and b is a constant.
   What is the value of b ?
   A. $-\frac{11}{5}$
   B. -3
   C. -2
   D. 0
   E. 3

17. Shown below is quadrilateral $ABCD$ inscribed in an ellipse. The figure will be placed in the standard (x, y) coordinate plane, and the ellipse will be described by the equation $\frac{(x-3)^2}{4} + \frac{y^2}{16} = 1$. Given that AC is the minor axis and BD is the major axis of the ellipse, what will be the coordinates of points A and B?
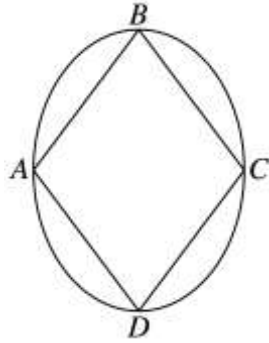
	point A	point B
A.	$(-3,4)$	$(0,16)$
B.	$(-3,2)$	$(0,16)$
C.	$(1,0)$	$(3,0)$
D.	$(1,0)$	$(3,4)$
E.	$(1,3)$	$(3,4)$