

Date Completed: _____
Mentor Initials: _____

A mentor can change everything.



Solving Equations

Non-Calculator: Multiple Choice

1. If $\frac{x+5}{3} = j$, and $j = 7$, what is the value of x ?
A) 2
B) 4
C) 16
D) 26
2. Christopher and Brandon are thrilled as they have finally accomplished their lifelong dream of opening a Cher-inspired bed and breakfast in Memphis. From business the previous summer, they know the demand for the Shoop Shoop Room is highest at the start of June, while the demand for the Believe Room is higher later in June. This year they are using the following formulas to calculate the rates for each room:

$$s = 150 - 2x$$
$$b = 80 + 3x$$

Where s is the nightly rate for the Shoop Shoop Room, b is the nightly rate for the Believe Room, and x is the number of days since June 1st. On which day will it cost the same to stay in the Shoop Shoop Room as it will to stay in the Believe Room?

- A) June 13th
 - B) June 14th
 - C) June 15th
 - D) June 16th
3. If $3x(x^2 - 1)(5x - 15) = 0$, what is the sum of all possible values of x ?
A) 2
B) 3
C) 4
D) 8

4. If $\sqrt{(x^2 - 9)} = 4$, What is the value of x ?
- A) $x = 5$
 - B) $x = \pm 5$
 - C) $x = \pm 13$
 - D) $x = \pm \sqrt{13}$

5. If $3(q - 2) + 4(q + 2) = 9$, what is value of q ?
- A) 1
 - B) 1.5
 - C) 2
 - D) 3

Non-Calculator: Grid In

6. For what value of z is the expression $\frac{y+5}{y+2} - \frac{3y-1}{3y+6}$ equivalent to $\frac{z+1}{3y+6}$ (Note: $y \neq -2$).

/	○	○		
.	○	○	○	○
0	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○
7	○	○	○	○
8	○	○	○	○
9	○	○	○	○

7. If $\frac{5-4q}{(q-2)^2} + \frac{4}{(q-2)} = \frac{-a}{(q-2)^2}$, what is the value of a ? (Note: $q \neq 2$)

/	○	○		
.	○	○	○	○
0	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○
7	○	○	○	○
8	○	○	○	○
9	○	○	○	○

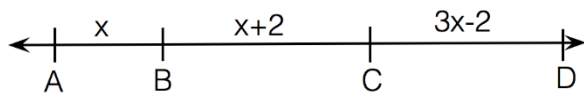
Calculator: Multiple Choice

8. If $x - y = 1$, what is the value of $\frac{9^x}{3^{2y}}$?
- A) 9
 - B) 27
 - C) 57
 - D) 81
9. If $y = 3\sqrt{5}$ and $3x = \sqrt{2}$, what is the value of xy ?
- A) 2.23
 - B) 3.16
 - C) 7.5
 - D) 9.48
10. If $\frac{c}{a} = 4$, what is the value of $\frac{6d}{c}$?
- A) 1.25
 - B) 1.5
 - C) 2
 - D) 24

$$\frac{m - n}{n} = p$$

11. In the equation above, if m is negative and n is positive, which of the following must be true?
- A) $p = 1$
 - B) $p > 1$
 - C) $p > -1$
 - D) $p < -1$

Calculator: Grid In



12. On \overline{AD} above, $\overline{BC} = \overline{CD}$. What is the length of \overline{AD} ?

/	○	○		
.	○	○	○	○
0	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○
7	○	○	○	○
8	○	○	○	○
9	○	○	○	○

13. If $2(z - 4) - \frac{(5z-3)}{4} = -3$, what is the value of z ?

/	○	○		
.	○	○	○	○
0	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	○	○	○	○
7	○	○	○	○
8	○	○	○	○
9	○	○	○	○