The Weekly Rigor

No. 122 "A mathematician is a machine for turning coffee into theorems." October 22, 2016

SAT Math Test Problem Children: Solving Quadratic Equations

(Part 4)

PROBLEMS

1. What are the solutions to $2x^2 + 8x + 2 = 0$?

2. What are the solutions to $3x^2 + 12x + 6 = 0$?

3. What are the solutions to $4x^2 + 16x + 8 = 0$?

4. If $x > 0$ and $5x^2 + 4x - 1 = 0$, what is the value of *x*?

5. If $x > 0$ and $3x^2 + 5x - 2 = 0$, what is the value of *x*?

6. If $x > 0$ and $3x^2 - 4x + 1 = 0$, what is the value of *x*?

7. What is the sum of all values of *m* that satisfy $3m^2 - 12m + 3 = 0$?

8. What is the sum of all values of *m* that satisfy $m^2 - 8m + 4 = 0$?

9. What is the sum of all values of *m* that satisfy $2m^2 - 18m + 3 = 0$?

10.

$$3x^2 + 6x - 9 = 0$$

If *r* and *s* are two solutions of the equation above and $r > s$, what is the value of $r - s$?

11.

$$5x^2 + 7x - 6 = 0$$

If *r* and *s* are two solutions of the equation above and $r > s$, what is the value of $r - s$?

12.

$$3x^2 + 8x - 11 = 0$$

If *r* and *s* are two solutions of the equation above and $r > s$, what is the value of $r - s$?

13.

$$x^2 - \frac{k}{2}x = 2p$$

In the quadratic equation above, *k* and *p* are constants. What are the solutions for *x* ?

A) $x = \frac{k}{4} \pm \frac{\sqrt{k^2+2p}}{4}$
B) $x = \frac{k}{2} \pm \frac{\sqrt{k^2+32p}}{4}$
C) $x = \frac{k}{4} \pm \frac{\sqrt{k^2+2p}}{8}$
D) $x = \frac{k}{4} \pm \frac{\sqrt{k^2+32p}}{4}$

14.

$$x^2 - \frac{k}{4}x = 4p$$

In the quadratic equation above, *k* and *p* are constants. What are the solutions for *x* ?

A) $x = \frac{k}{4} \pm \frac{\sqrt{k^2+4p}}{4}$
B) $x = \frac{k}{2} \pm \frac{\sqrt{k^2+4p}}{4}$
C) $x = \frac{k}{8} \pm \frac{\sqrt{k^2+256p}}{8}$
D) $x = \frac{k}{4} \pm \frac{\sqrt{k^2+256p}}{4}$