## The Weekly Rigor

No. 148

"A mathematician is a machine for turning coffee into theorems."

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## SAT Math Test Problem Children: Randomized Problem Set 2 (Part 1)

1.

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

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

2.

$$y = x + 5$$
$$3x - 4y = 10$$

The system of equations above consists of two equations, and the graph of each equation in the *xy*-plane is a line. Which of the following statements is true about these two lines?

## A) The lines are parallel.

- B) The lines are the same.
- C) The lines are perpendicular.
- D) The lines intersect at (-30, -25).

3.

$$\sqrt{x-a} = x - 4$$

If a = 4, what is the solution set of the equation above?



In the triangle above, the cosine of  $x^{\circ}$  is 0.6. What is the sine of  $y^{\circ}$ ?

5.

$$\frac{5-2i}{4-3i}$$

If the expression above is rewritten in the form a + bi, where *a* and *b* are real numbers, what is the value of *a*? (Note:  $i = \sqrt{-1}$ )

6. If  $a = 7\sqrt{2}$  and  $3a = \sqrt{2x}$ , what is the value of x?

7.



Note: Figures not drawn to scale.

The angles shown above are acute and  $sin(a^\circ) = cos(b^\circ)$ . If a = 6k - 18 and b = 4k - 19, what is the value of k?

A) 12.7

B) 21.7

C) 3.5

D) 4.5

"Only he who never plays, nev	ver loses."
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