

# The Weekly Rigor

No. 105

“A mathematician is a machine for turning coffee into theorems.”

June 25, 2016

## SAT Math Test Problem Children: Complex Numbers (Part 4)

15. Which of the following complex numbers is equivalent to  $\frac{1+i}{1-i}$ ? (Note:  $i = \sqrt{-1}$ )

- A)  $1 + i$
- B)  $1 - i$
- C)  $i$
- D)  $-i$

16. Which of the following complex numbers is equivalent to  $\frac{1-i}{1+i}$ ? (Note:  $i = \sqrt{-1}$ )

- A)  $i$
- B)  $-i$
- C)  $1 + i$
- D)  $1 - i$

17. Which of the following complex numbers is equivalent to  $\frac{2+i}{2-i}$ ? (Note:  $i = \sqrt{-1}$ )

- A)  $\frac{2}{2} - i$
- B)  $1 - i$
- C)  $\frac{3}{5} - \frac{4i}{5}$
- D)  $\frac{3}{5} + \frac{4i}{5}$

18. Which of the following complex numbers is equivalent to  $\frac{-5-2i}{4-i}$ ? (Note:  $i = \sqrt{-1}$ )

A)  $\frac{-5}{4} + 2i$

B)  $\frac{-5}{4} - 2i$

C)  $\frac{-18}{17} + \frac{13i}{17}$

D)  $\frac{-18}{17} - \frac{13i}{17}$

19. Which of the following complex numbers is equivalent to  $\frac{-3-5i}{7-2i}$ ? (Note:  $i = \sqrt{-1}$ )

A)  $\frac{-3}{7} + \frac{5i}{2}$

B)  $\frac{3}{7} - \frac{5i}{2}$

C)  $\frac{-11}{53} - \frac{41i}{53}$

D)  $\frac{11}{53} + \frac{41i}{53}$

20. Which of the following complex numbers is equivalent to  $\frac{-3+2i}{2-5i}$ ? (Note:  $i = \sqrt{-1}$ )

A)  $\frac{-16}{29} + \frac{11i}{29}$

B)  $\frac{-16}{29} - \frac{11i}{29}$

C)  $\frac{-3}{2} + \frac{2i}{5}$

D)  $\frac{-3}{2} - \frac{2i}{5}$

21.

$$\frac{6 - i}{3 - 2i}$$

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:  $i = \sqrt{-1}$ )

“Only he who never plays, never loses.”