

Nonlinear Equations & Equivalent Expressions

Foundation to Challenge

Practice should make the test feel easier, not merely familiar.

Work without the answer key first. Check answers through the SAT Practice Library after completing the set.

FOUNDATION

1

For all real x , $24\left(\frac{x^3}{4} + \frac{x^2}{6} + \frac{5x}{8}\right) = ax^3 + bx^2 + cx$. What is $a + b + c$?

STANDARD

2

Positive constants p and q satisfy $50x^2 - 18 = 2(px + q)(px - q)$ for all x . What is pq ?

ADVANCED

3

For $x \neq -1$ and $x \neq -\frac{2}{k}$, the identity $\frac{4x}{x+1} + \frac{7}{kx+2} = (8x^2 + 15x + 7) / ((x+1)(kx+2))$ holds. What is k ?

STANDARD

4 If $(x + 4y)^2 = x^2 + 16y^2 + 80$, what is $x^2 y^2$?

5 If $n < 0$ and $9x^2 + mx + 16 = (3x + n)^2$ for all x , what is $m + n$?

ADVANCED

6 Which value of x satisfies $\sqrt{2x + 15} = x$?

- A. -3
- B. 0
- C. 3
- D. 5

FOUNDATION

7 For $x \neq -\frac{7}{2}$, which expression is equivalent to $\frac{4x^2 - 49}{2x + 7}$?

- A. $2x + 7$
- B. $2x - 7$
- C. $4x - 7$
- D. $x - \frac{7}{2}$

CHALLENGE

8 For $x \neq 0$, if $x + \frac{6}{x} = 5$, what is the greater solution?

FINISHED?

Check your answers online

aryalanupme.github.io/sat-nonlinear-equations.html

Do not stop at “wrong.” Identify why it was wrong: concept, algebra, arithmetic, interpretation, calculator choice, or timing.

I do not correct the answer first. I correct the reason.

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