

Hard SAT Math Worksheet

Name: _____ Date: _____

Circle one answer for each question. Use the blank space for calculations. A calculator is allowed.

1. The equation $x^2 - kx + 48 = 0$ has two positive solutions. One solution is three times the other. What is k ?

A. 8
B. 16
C. 12
D. 48

2. $\sqrt{2x + 9}$ is equal to $x - 3$. What value of x satisfies the equation?

A. 8
B. 3
C. 6
D. 0

3. The graph $y = ax^2 + bx + c$ has vertex $(3, -4)$ and passes through $(0, 14)$. What is $a + b + c$?
- A. 2
 - B. 12
 - C. 4
 - D. 14
4. The line $y = mx + 7$ intersects the parabola $y = x^2 + 3x + 11$ at exactly one point. If m is positive, what is m ?
- A. 4
 - B. 1
 - C. 3
 - D. 7

5. A positive quantity is decreased by $p\%$, then the result is increased by $p\%$, where $0 < p < 100$. The final quantity is 84% of the original. What is p ?
- A. 16
B. 40
C. 32
D. 84
6. For the quadratic function $f(x) = ax^2 + bx + c$, $f(1) = 8$, $f(3) = 26$, and $f(5) = 60$. What is $f(8)$?
- A. 120
B. 133
C. 141
D. 136

7. The equation $x^2 - 10x + k = 0$ has two positive roots whose difference is 4. What is k ?

- A. 9
- B. 16
- C. 21
- D. 24

8. For positive constants a and b , $f(x) = a(b^x)$. If $f(2) = 12$ and $f(5) = 96$, what is $f(0)$?

- A. 2
- B. 3
- C. 4
- D. 6

9. A quadratic f has zeros -2 and 6 . Its minimum value is -32 . What is $f(0)$?

- A. -32
- B. -24
- C. -16
- D. 24

10. For which positive value of k does $x^2 - 6x + k = 2x - k$ have exactly one real solution?

- A. 4
- B. 8
- C. 12
- D. 16

11. A positive quantity is increased by $p\%$ and then increased by $2p\%$. The result is 168% of the original. What is p ?

- A. 10
- B. 20
- C. 30
- D. 40

12. If $x + \frac{1}{x} = 5$ for a nonzero real x , what is $x^2 + \frac{1}{x^2}$?

- A. 15
- B. 21
- C. 23
- D. 25