1. If $a^2 + 14a = 51$ and $a > 0$, what is the value of $a + 7$?

2. The function f is defined by $f(x) = 2x^3 + 3x^2 + cx + 8$, where c is a constant. In the xy-plane, the graph of the f intersects the x-axis at the three points: $(-4, 0)$, $(\frac{1}{2}, 0)$, $(p, 0)$. What is the value of c?

   A) -18

   B) -2

   C) 2

   D) 10

3. $\begin{cases} x^2 + y^2 = 5 \\ y = x^2 - 3 \\ x - y = 1 \end{cases}$

   In the system of three equations above, and their graphs in the xy-plane are shown above. How many solutions does the system have?

   A) One

   B) Two

   C) Three

   D) Four

4. What is one possible solution to the equation $\frac{24}{x+1} - \frac{12}{x-1} = 1$?

5. Anise needs to complete a printing job using both of the printers in her office. One of the printers is twice as fast as the other, and together the printers can complete the job in 5 hours. The equation below represents the situation described.

$$\frac{1}{x} + \frac{2}{x} = \frac{1}{5}$$

   Which of the following describes what the expression $\frac{1}{x}$ represents in this equation?

   A) The time, in hours, that it takes the slower printer to complete the printing job alone.

   B) The portion of the job that the slower printer would complete in one hour.

   C) The portion of the job that the faster printer would complete in two hours.

   D) The time, in hours, that is takes the slower printer to complete $\frac{1}{5}$ of the printing job.

6. $\begin{cases} x^2 + y^2 = 153 \\ y = -4x \end{cases}$

   If (x, y) is a solution to the system of equations above, what is the value of x^2?

   A) -51

   B) 3

   C) 9

   D) 144

7. If the expression $\frac{4x^2}{2x-1}$ is written in the equivalent for $\frac{1}{2x-1} + A$, what is A in terms of x?

   A) $2x + 1$

   B) $2x - 1$

   C) $4x^2$

   D) $4x^2 - 1$

ANSWER KEY

1. 10
2. A
3. B
4. 5 or 7
5. B
6. C
7. A