Drill 1

Answers can be found in Part IV.

3

Which of the following equivalent forms of the equation $x^2 + 8x + 15 = 0$ would be the most useful for finding the x-intercepts of the equation?

A) $x(x) + 8(x) + 15 = 0$

B) $x^2 + 3x + 5x + 15 = 0$

C) $(x + 3)(x + 5) = 0$

D) $x^2 + 8x + 4 + 11 = 0$

4

Monster Truck Inc. leases a new truck for a down payment of $3,200 plus monthly payments of $380 per month for 36 months. Which of the following functions, f, represents the total amount paid, in dollars, after m months, where $0 \le m \le 36$?

A) $f(m) = 380 + 3{,}200m$

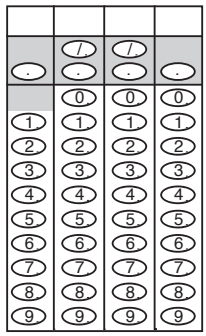
B) $f(m) = 3{,}200 + 36m$

C) $f(m) = 3{,}200 + 380m$

D) $f(m) = 10{,}480 - 380m$

15

If $f(x) = x^2 - x + 4$, a is non-negative, and $f(a) = 10$, what is the value of a ?



9

The number of bonus points, $B(p)$, that a credit card holder receives is given by the function $B(p) = ap + 7$, where p represents the number of purchases made and a is a constant. If the number of purchases is increased by 4, the number of bonus points increases by 25. What is the value of a ?

A) 4

B) 4.5

C) 6.25

D) 11

21

If $f(x) = x^{-\frac{2}{3}}$, what is the value of $\frac{f(8)}{f(3)}$?

A) $\frac{4}{\sqrt[3]{9}}$

B) $\frac{8}{3}$

C) $\sqrt{\frac{512}{27}}$

D) $\frac{\sqrt[3]{9}}{4}$

23

The temperature, T, in degrees Celsius on a winter day can be written as a function of x, the time in hours since midnight (12:00 A.M.), as shown below.

$$T(x) = -\frac{1}{10}x^2 + \frac{24}{10}x - \frac{44}{10}$$

If $100 = x^2 - 24x + 144$ is an equivalent form of the equation when $T(x) = 0$, which of the following gives a time on that day when the temperature was 0°C ?

A) 6 P.M.

B) 10 P.M.

C) 3 A.M.

D) 9 A.M.

12

x	–1	j	5
$f(x)$	2	j	–6

The table above shows selected values for the linear function $f(x)$. What is the value of j ?

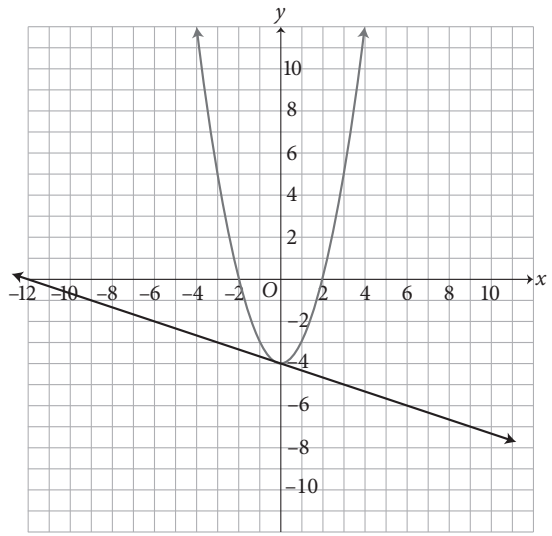
A) $-\frac{1}{6}$

B) $\frac{2}{7}$

C) $\frac{5}{7}$

D) $\frac{7}{6}$

Questions 30 and 31 refer to the following information.



In the above graph, parabola $f(x)$ is represented by the equation $f(x) = x^2 - 4$ and line $g(x)$ is represented by the equation $g(x) = -\frac{1}{3}x - 4$. Line $g(x)$ intersects parabola $f(x)$ at point $(0, -4)$.

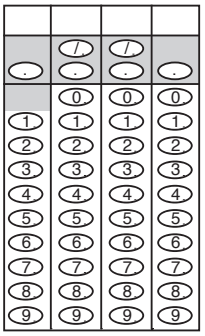
30

For $x = 12$, how much greater is the value of $f(x)$ than $g(x)$?

	/ .	/ .	.
.	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

31

A new line, $h(x)$, is added to the graph. The line $h(x)$ is perpendicular to line $g(x)$, intersecting with line $g(x)$ at the point (–12, 0). What is the x-coordinate of the point where line $h(x)$ will intersect parabola $f(x)$ in Quadrant I ?



QUADRATIC EQUATIONS

Ah, quadratics. You're likely to see several questions on the PSAT that require you to expand, factor, or solve quadratics. You may even need to find the vertex of a parabola or the points of intersection of a quadratic and a line. So let's review, starting with the basics.

Expanding

Most often you'll be asked to expand an expression simply by multiplying it out. When working with an expression of the form $(x + 3)(x + 4)$, multiply it out using the following rule:

FOIL = First Outer Inner Last

Start with the *first* figure in each set of parentheses: $x \times x = x^2$.

Now do the two *outer* figures: $x \times 4 = 4x$.

Next, the two *inner* figures: $3 \times x = 3x$.

Finally, the *last* figure in each set of parentheses: $3 \times 4 = 12$.

Add them all together, and we get $x^2 + 4x + 3x + 12$, or $x^2 + 7x + 12$.