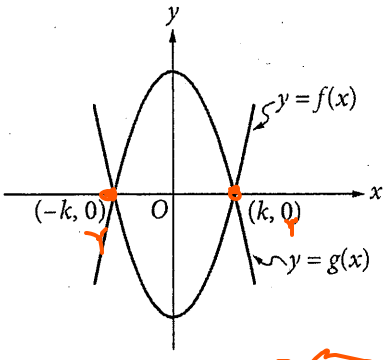
13



The functions f and g, defined by $f(x) = 8x^2 - 2$ and $g(x) = -8x^2 + 2$, are graphed in the xy-plane above. The graphs of f and g intersect at the points $(k, 0)$ and $(-k, 0)$. What is the value of k ?

A) $\frac{1}{4}$

B) $\frac{1}{2}$

C) 1

D) 2

30

$y = x^2 - a$

In the equation above, a is a positive constant and the graph of the equation in the xy-plane is a parabola. Which of the following is an equivalent form of the equation?

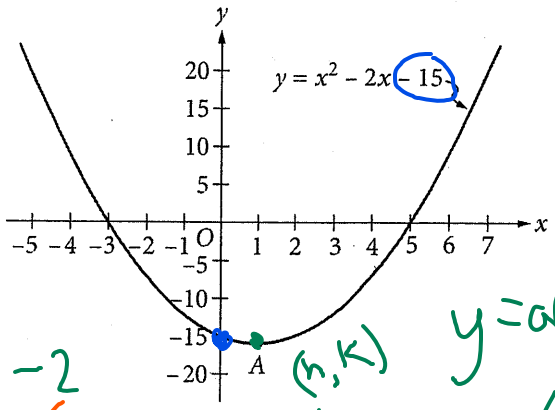
A) $y = (x + a)(x - a)$

B) $y = (x + \sqrt{a})(x - \sqrt{a})$

C) $y = \left(x + \frac{a}{2}\right)\left(x - \frac{a}{2}\right)$

D) $y = (x + a)^2$

30



Which of the following is an equivalent form of the equation of the graph shown in the xy-plane above, from which the coordinates of vertex A can be identified as constants in the equation?

A) $y = (x + 3)(x - 5)$

B) $y = (x - 3)(x + 5)$

C) $y = x(x - 2) - 15$

D) $y = (x - 1)^2 - 16$

34

In the xy-plane, the graph of $y = 3x^2 - 14x + q$ intersects the graph of $y = x$ at the points $(0, 0)$ and (a, a). What is the value of a ?

36

$$h(x) = \frac{1}{(x - 5)^2 + 4(x - 5) + 4}$$

For what value of x is the function h above undefined?

4

Nick surveyed a random sample of the freshman class of his high school to determine whether the Fall Festival should be held in October or November. Of the 90 students surveyed, 25.6% preferred October. Based on this information, about how many students in the entire 225-person class would be expected to prefer having the Fall Festival in October?

A) 50

B) 60

C) 75

D) 80

14

A radioactive substance decays at an annual rate of 13 percent. If the initial amount of the substance is 325 grams, which of the following functions f models the remaining amount of the substance, in grams, t years later?

A) $f(t) = 325(0.87)^t$

B) $f(t) = 325(0.13)^t$

C) $f(t) = 0.87(325)^t$

D) $f(t) = 0.13(325)^t$

20

Alma bought a laptop computer at a store that gave a 20 percent discount off its original price. The total amount she paid to the cashier was p dollars, including an 8 percent sales tax on the discounted price. Which of the following represents the original price of the computer in terms of p ?

A) $0.88p$

B) $\frac{p}{0.88}$

C) $(0.8)(1.08)p$

D) $\frac{p}{(0.8)(1.08)}$