9-4 Practice

Solving Quadratic Equations by Completing the Square

Find the value of c that makes each trinomial a perfect square.

1. $x^2 - 24x + c$ **144**

2. $x^2 + 28x + c$ **196**

3. $x^2 + 40x + c$ **400**

4. $x^2 + 3x + c$ $\dfrac{9}{4}$

5. $x^2 - 9x + c$ $\dfrac{81}{4}$

6. $x^2 - x + c$ $\dfrac{1}{4}$

Solve each equation by completing the square. Round to the nearest tenth if necessary.

7. $x^2 - 14x + 24 = 0$

2, 12

8. $x^2 + 12x = 13$

−13, 1

9. $x^2 - 30x + 56 = -25$

3, 27

10. $x^2 + 8x + 9 = 0$

−6.6, −1.4

11. $x^2 - 10x + 6 = -7$

1.5, 8.5

12. $x^2 + 18x + 50 = 9$

−15.3, −2.7

13. $3x^2 + 15x - 3 = 0$

−5.2, 0.2

14. $4x^2 - 72 = 24x$

−2.2, 8.2

15. $0.9x^2 + 5.4x - 4 = 0$

$-6\dfrac{2}{3}, \dfrac{2}{3}$

16. $0.4x^2 + 0.8x = 0.2$

−2.2, 0.2

17. $\dfrac{1}{2}x^2 - x - 10 = 0$

−3.6, 5.6

18. $\dfrac{1}{4}x^2 + x - 2 = 0$

−5.5, 1.5

19. NUMBER THEORY The product of two consecutive even integers is 728. Find the integers.
26, 28

20. BUSINESS Jaime owns a business making decorative boxes to store jewelry, mementos, and other valuables. The function $y = x^2 + 50x + 1800$ models the profit y that Jaime has made in month x for the first two years of his business.

a. Write an equation representing the month in which Jaime's profit is $2400.
$x^2 + 50x + 1800 = 2400$

b. Use completing the square to find out in which month Jaime's profit is $2400.
the tenth month

21. PHYSICS From a height of 256 feet above a lake on a cliff, Mikaela throws a rock out over the lake. The height H of the rock t seconds after Mikaela throws it is represented by the equation $H = -16t^2 + 32t + 256$. To the nearest tenth of a second, how long does it take the rock to reach the lake below? (*Hint:* Replace H with 0.) **5.1 s**