Name: **Date:**

Practice: The Remainder Theorem B

For problems 1 and 2, use synthetic division to find each quotient.

1. $(x^2 + 8x + 10) \div (x - 2)$

2. $(3x^5 - 4x^3 + 8x + 7) \div (x + 1)$

For problems 3 and 4, use synthetic substitution to evaluate each function.

3. $p(x) = x^2 + 5x + 10$ for $x = -2$

4. $p(x) = 6x^4 + 8x + 4x + 2$ for $x = 1$

For problems 5 and 6, find the value of k.

5. $(x^2 + kx + 4) \div (x + 1)$ has a remainder of 11.

6. $(2x^2 + 7x + k) \div (x - 2)$ has a remainder of 30.

continued

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For problems 7–10, use the Remainder Theorem to solve each problem.

7. The area in square inches of a tabletop can be expressed as the product of the tabletop's length and width, or $A(x) = 4x^2 - 18x + 18$. If the length of the tabletop is $(x - 3)$ inches, what is the width of the tabletop?

8. The area in square centimeters of the front of an envelope can be expressed as the product of the envelope's length and width, or $A(x) = 5x^2 + 44x + 63$. If the width of the envelope is $(x + 7)$ centimeters, what is the length of the envelope?

9. A generator produces voltage using levels of current modeled by $I(t) = t + 2$, where $t > 0$ represents the time in seconds. The power of the generator can be modeled by $P(t) = 0.5t^3 + 9t^2 + 16t$. If voltage is calculated by dividing $P(t)$ by $I(t)$, what expression represents the voltage of the generator?

10. A second generator produces voltage using levels of current modeled by $I(t) = t + 5$, where $t > 0$ represents the time in seconds. The power of the generator can be modeled by $P(t) = 0.2t^3 + 9t^2 + 40t$. What expression represents the voltage of this generator?