

## Lesson 13 Practice Problems

1. The polynomial function  $B(x) = x^3 - 21x + 20$  has a known factor of  $(x - 4)$ . Rewrite  $B(x)$  as a product of linear factors.

2. Let the function  $P$  be defined by  $P(x) = x^3 + 7x^2 - 26x - 72$  where  $(x + 9)$  is a factor. To rewrite the function as the product of two factors, long division was used but an error was made:

$$\begin{array}{r}
 x^2 + 16x + 118 \\
 x + 9 \overline{) x^3 + 7x^2 - 26x - 72} \\
 \underline{-x^3 + 9x^2} \phantom{- 26x - 72} \\
 16x^2 - 26x \phantom{- 72} \\
 \underline{-16x^2 + 144x} \phantom{- 72} \\
 118x - 72 \\
 \underline{-118x + 1062} \\
 990
 \end{array}$$

How can we tell by looking at the remainder that an error was made somewhere?

3. For the polynomial function  $A(x) = x^4 - 2x^3 - 21x^2 + 22x + 40$  we know  $(x - 5)$  is a factor. Select **all** the other linear factors of  $A(x)$ .

A.  $(x + 1)$

B.  $(x - 1)$

C.  $(x + 2)$

D.  $(x - 2)$

E.  $(x + 4)$

F.  $(x - 4)$

G.  $(x + 8)$

4. Match the polynomial function with its constant term.

A.  $P(x) = (x - 2)(x - 3)(x + 7)$                       1. -210

B.  $P(x) = (x + 2)(x - 3)(x + 7)$                       2. -42

C.  $P(x) = \frac{1}{2}(x - 2)(x - 3)(x + 7)$                       3. 21

D.  $P(x) = 5(x - 2)(x - 3)(x + 7)$                       4. 42

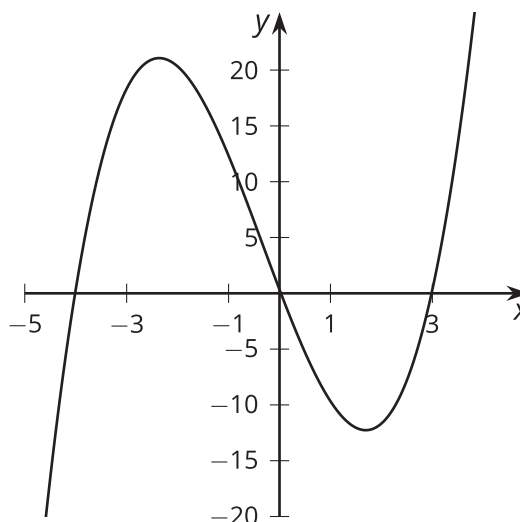
E.  $P(x) = -5(x - 2)(x - 3)(x + 7)$                       5. 210

(From Unit 2, Lesson 6.)

5. What are the solutions to the equation  $(x - 2)(x - 4) = 8$ ?

(From Unit 2, Lesson 11.)

6. The graph of a polynomial function  $f$  is shown. Which statement is true about the end behavior of the polynomial function?



- A. As  $x$  gets larger and larger in either the positive or the negative direction,  $f(x)$  gets larger and larger in the positive direction.
- B. As  $x$  gets larger and larger in the positive direction,  $f(x)$  gets larger and larger in the positive direction. As  $x$  gets larger and larger in the negative direction,  $f(x)$  gets larger and larger in the negative direction.
- C. As  $x$  gets larger and larger in the positive direction,  $f(x)$  gets larger and larger in the negative direction. As  $x$  gets larger and larger in the negative direction,  $f(x)$  gets larger and larger in the positive direction.
- D. As  $x$  gets larger and larger in either the positive or negative direction,  $f(x)$  gets larger and larger in the negative direction.

(From Unit 2, Lesson 8.)

7. The polynomial function  $p(x) = x^3 + 3x^2 - 6x - 8$  has a known factor of  $(x + 4)$ .
- Rewrite  $p(x)$  as the product of linear factors.
  - Draw a rough sketch of the graph of the function.

(From Unit 2, Lesson 12.)