LESSON 35

1. 4 **2.** B **3.** 3 **4.** 30

5. $2x^2 - 4x - 5$

6. $(x+4)(x-2)(x^2+2x+4)$

7. $(x+1)(x-1)(x+2)(x-2)$

8. 0 **9.** 3 **10.** C

Worked-out solutions:

3. $(x-2)(2x-5) = 2x^2 - 9x + 10$
$a + b + c = 2 - 9 + 10 = 3$

4. $(x+1)(px+q)$
$= px^2 + qx + px + q$
$= px^2 + (p+q)x + q$
$= 3x^2 + rx - 5$

$p = 3, q = -5$
$r = p + q = -2$
$pqr = (3)(-5)(-2)$
$= 30$

5. $(x+3)(x-3) + (x-2)^2$
$= x^2 - 9 + x^2 - 4x + 4$
$= 2x^2 - 4x - 5$

6. $x^4 + 4x^3 - 8x - 32$
$= x^3(x+4) - 8(x+4)$ Factor by grouping.
$= (x+4)(x^3 - 8)$
$= (x+4)(x-2)(x^2+2x+4)$ Difference of cubes

7. $x^4 - 5x^2 + 4$
$= u^2 - 5u + 4$ Let $u = x^2$.
$= (u-1)(u-4)$ Factor.
$= (x^2-1)(x^2-4)$ Substitute back.
$= (x+1)(x-1)(x+2)(x-2)$ Difference of sq.

8. Use long division to find the quotient and remainder.

$$\begin{array}{r|l} & 2x + 3 \\ \hline 3x-1 & 6x^2 + 7x + 3 \\ & 6x^2 - 2x \\ \hline & 9x + 3 \\ & 9x - 3 \\ \hline & 6 \end{array}$$

Quotient: $2x + 3$
Remainder: 6
$a = 3, b = 6$
$2a - b = 2(3) - 6$
$= 0$

9. The remainder $p(2)$ must be zero.
$p(2) = 2k - 6 = 0$
$k = 3$

10. A) $(x-1)$ is a factor because $q(1) = 0$.
B) $(x+1)$ is a factor because $q(-1) = 0$.
C) $(x-2)$ is not a factor because $q(2) = 24 \neq 0$.
D) $(x+2)$ is a factor because $q(-2) = 0$.