Polynomials Practice

Choose one answer per question. Circle A, B, C, or D.

1. What is the degree of $-6 + 4x^2 - x^5 + 3x$?
   A. 5
   B. 2
   C. 3
   D. 6

2. What is the coefficient of x^3 in $9x^5 - 2x^3 + x - 8$?
   A. -8
   B. 2
   C. -2
   D. 9

3. Which expression is a polynomial in x with real coefficients?
   A. $\sqrt{x} + 3x^2$
   B. $\sqrt{2} + 3x^2$
   C. $x^3 + 2/x$
   D. $x^2 + 3^x$

4. If $P(x) = x^3 - 2x + 4$, what is $P(-2)$?
   A. 16
   B. -8
   C. 8
   D. 0

5. What is $(4x^3 - 2x + 1) + (-x^3 + 5x - 6)$ after combining like terms?
   A. $5x^3 + 3x - 5$
   B. $3x^3 + 3x - 5$
   C. $3x^3 + 7x + 7$
   D. $3x^3 + 3x + 7$

6. What is $(3x^2 - x + 4) - (x^2 + 5x - 2)$ after combining like terms?
   A. $2x^2 - 6x + 6$
   B. $2x^2 + 4x + 2$
   C. $2x^2 - 6x + 2$
   D. $4x^2 - 6x + 6$

7. What is the expanded form of $-3x^2(2x^3 - x + 4)$?

A. $-6x^5 + 3x - 12$
B. $-6x^6 + 3x^3 - 12x^2$
C. $-6x^5 - 3x^3 - 12x^2$
D. $-6x^5 + 3x^3 - 12x^2$

8. What is the expanded form of $(x^2 + 3)(2x - 5)$?

A. $2x^3 + 5x^2 + 6x - 15$
B. $2x^3 - 15$
C. $2x^3 - 5x^2 + 6x - 15$
D. $2x^3 - 5x^2 + 3x - 15$

9. For $x \neq 0$, what is $(8x^5 - 12x^3 + 4x^2)$ divided by $4x^2$?

A. $2x^3 - 3x + 1$
B. $2x^3 - 3x$
C. $2x^3 - 3x + 4$
D. $2x^7 - 3x^5 + x^4$

10. A rectangle is $(x + 6)$ meters by $(x + 2)$ meters. A rectangular hole measuring x meters by $(x - 2)$ meters is cut out. For $x > 2$, what polynomial gives the remaining area in square meters?

A. $8x + 12$
B. $6x + 12$
C. $2x^2 + 6x + 12$
D. $10x + 12$

11. Let $P(x) = ax^3 + 4x^2 - 2$ and $Q(x) = 3x^3 - x^2 + 5x$. What value of a makes $P(x) + Q(x)$ have degree exactly 2?

A. 3
B. 0
C. -3
D. -4

12. Two polynomials each have degree 4. Their leading coefficients are 5 and -2. What are the degree and leading coefficient of their product?

A. Degree 8, leading coefficient 3
B. Degree 8, leading coefficient -10
C. Degree 16, leading coefficient -10
D. Degree 4, leading coefficient -10

13. For $P(x) = -2x^6 + 30x^3 - 1$, what happens to $P(x)$ as x goes far to the left or far to the right?

A. It rises on the left and falls on the right.
B. It rises without bound on both ends.
C. It falls on the left and rises on the right.
D. It falls without bound on both ends.

14. What is the remainder when $2x^3 - x + 5$ is divided by $x + 2$?

A. -9
B. 19
C. -13
D. 5

15. A polynomial P has degree at most 3 and satisfies $P(-x) = P(x)$ for all real x. Also $P(0) = -1$ and $P(2) = 11$. Which formula fits all three conditions?

A. $2x^3 - x^2 - 1$
B. $x^3 + x^2 - 1$
C. $3x^2 - 1$
D. $3x^2 + 1$