

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Perform the indicated operations. Express the answer as a polynomial written in standard form.

1) $(9z + 13)(9z - 13)$ 1) _____

- A) $81z^2 - 169$ B) $81z^2 - 234z - 169$
 C) $z^2 - 169$ D) $81z^2 + 234z - 169$

2) $(x + 2y)^3$ 2) _____

- A) $x^3 + 6x^2y + 12xy^2 + 8y^3$ B) $x^3 + 8y^3$
 C) $x^3 + 2x^2y + 4xy + 4xy^2 + 8y^2 + 8y^3$ D) $3(x + 2y)$

3) $(2x + 5y)^2$ 3) _____

- A) $2x^2 + 25y^2$ B) $2x^2 + 20xy + 25y^2$
 C) $4x^2 + 20xy + 25y^2$ D) $4x^2 + 25y^2$

Factor completely. If the polynomial cannot be factored, say it is prime.

4) $x^3 + 64$ 4) _____

- A) $(x - 64)(x^2 - 1)$ B) $(x - 4)(x^2 + 4x + 16)$
 C) $(x + 4)(x^2 - 4x + 16)$ D) $(x + 4)(x^2 + 16)$

5) $9x^2 + 30x + 25$ 5) _____

- A) $(3x - 5)^2$ B) $(9x + 1)(x + 25)$ C) $(3x + 5)^2$ D) $(3x + 5)(3x - 5)$

Perform the indicated operations and simplify the result. Leave the answer in factored form.

6) $\frac{10x^2 - 3x - 4}{5x^2 - x - 4} \cdot \frac{15x^2 + 12x}{1 - 4x^2}$ 6) _____

- A) $\frac{3x(5x + 4)}{(1 - 2x)(x - 1)}$ B) $\frac{3x}{(1 - 2x)(x - 1)}$ C) $\frac{(5x + 4)(5x - 4)}{(1 - 2x)(x - 1)}$ D) $\frac{3x(5x - 4)}{(1 - 2x)(x - 1)}$

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

7) $\frac{x + 3}{x^2 + x - 12} - \frac{x + 4}{x^2 - 9}$ 7) _____

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

Find the quotient and the remainder.

8) $8x^3 - 22x^2 + 7x + 13$ divided by $-2x + 3$ 8) _____

- A) $-4x^2 + 5x + 4$; remainder 0 B) $-4x^2 + 5x + 4$; remainder 1
 C) $-4x^2 + 5x + 4$; remainder 4 D) $x^2 + 4$; remainder 5

9) $8w^4 + 12w^3 - 2w$ divided by $2w^2 + w$ 9) _____

- A) $4w^2 + 4w$; remainder $-6w$ B) $4w^2 + 4w - 2$; remainder 0
 C) $4w^2 + 6w$; remainder $-2w$ D) $4w^2 + 8w + 4$; remainder $2w$

Use synthetic division to find the quotient and remainder.

10) $6x^5 - 5x^4 + x - 4$ divided by $x + \frac{1}{2}$ 10) _____

A) $6x^4 - 8x^3 + 4x^2 - 2x + 2$; remainder -5

B) $6x^4 - 8x^3 + 5$; remainder $-\frac{13}{2}$

C) $6x^4 - 2x^3 - x^2 + \frac{1}{2}x + \frac{5}{4}$; remainder $-\frac{27}{8}$

D) $6x^4 - 2x^3 + x^2 - \frac{1}{2}x + \frac{5}{4}$; remainder $-\frac{37}{8}$

Write the expression in the standard form $a + bi$.

11) $(8 + 9i) - (-6 + i)$ 11) _____

A) $14 - 8i$

B) $-14 - 8i$

C) $14 + 8i$

D) $2 + 10i$

12) $\frac{2}{6 + 8i}$ 12) _____

A) $-\frac{3}{7} + \frac{4}{7}i$

B) $\frac{3}{25} - \frac{4}{25}i$

C) $\frac{3}{25} + \frac{4}{25}i$

D) $-\frac{3}{7} - \frac{4}{7}i$

Without solving, determine the character of the solutions of the equation in the complex number system.

13) $x^2 + 2x + 6 = 0$ 13) _____

A) two unequal real solutions

B) two complex solutions that are conjugates of each other

C) a repeated real solution

Solve the equation in the complex number system.

14) $x^2 + x + 8 = 0$ 14) _____

A) $\left\{\frac{1}{2} - \frac{\sqrt{31}}{2}i, \frac{1}{2} + \frac{\sqrt{31}}{2}i\right\}$

B) $\left\{\frac{-1 - \sqrt{31}}{2}, \frac{-1 + \sqrt{31}}{2}\right\}$

C) $\left\{\frac{1 - \sqrt{31}}{2}, \frac{1 + \sqrt{31}}{2}\right\}$

D) $\left\{-\frac{1}{2} - \frac{\sqrt{31}}{2}i, -\frac{1}{2} + \frac{\sqrt{31}}{2}i\right\}$

15) $x^3 - 27 = 0$ 15) _____

A) $\left\{3, -\frac{3}{2} - \frac{3\sqrt{3}}{2}i, -\frac{3}{2} + \frac{3\sqrt{3}}{2}i\right\}$

B) $\{3\}$

C) $\left\{3, -\frac{3}{2} - \frac{3\sqrt{3}}{2}i, -\frac{3}{2} + \frac{3\sqrt{3}}{2}i\right\}$

D) $\{3, -3i, 3i\}$

Answer Key

Testname: A 3 A 4 AND A 6 REVIEW

1) A

2) A

3) C

4) C

5) C

6) D

7) $\frac{-2x - 7}{(x + 4)(x + 3)(x - 3)}$

8) B

9) B

10) A

11) C

12) B

13) B

14) D

15) A

