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Where the objective says 9.x — it means A.x (Appendix A)

> DO ALL WORK NEATLY ON SEPARATE PAPER

Determine which value(s), if any, must be excluded from the domain of the variable in the expression.

1) $\frac{x^3 + 7x^2 - 18x}{x^2 + 5x}$

denominator ≠ 0
 $x^2 + 5x \neq 0$
 $x(x+5) \neq 0$
 $x \neq 0 \quad x \neq -5$

1) A

A) $x = 0, x = -5$

C) $x = -5$

B) $x = 2, x = -9$

D) $x = 0, x = -5, x = 2, x = -9$

Objective: (9.1) Determine the Domain of a Variable

Simplify the expression.

2) $(-5)^2 = (-5)(-5) = 25$

2) B

A) 10

B) 25

C) -25

D) -36

Objective: (9.1) Use the Laws of Exponents

3) $-11^2 = -11 \cdot 11 = -121$

3) B

A) 121

B) -121

C) 144

D) -22

Objective: (9.1) Use the Laws of Exponents

Simplify the expression. Express the answer so that all exponents are positive. Whenever an exponent is 0 or negative, we assume that the base is not 0.

4) $(x-6y^9)^{-4} z^2 = x^{-24} y^{-36} z^2 = \frac{x^{24} z^2}{y^{36}}$

4) D

A) $\frac{x^{24}}{y^{36}z^2}$

B) $\frac{y^{36}}{x^{24}z^2}$

C) $\frac{y^{36}z^2}{x^{24}}$

D) $\frac{x^{24}z^2}{y^{36}}$

Objective: (9.1) Use the Laws of Exponents

5) $\left(\frac{-8x^5y-5}{5z^5}\right)^{-2} = \left(\frac{5z^5}{-8x^5y-5}\right)^2 = \frac{25z^{10}}{64x^{10}y^{-10}} = \frac{25y^{10}z^{10}}{64x^{10}}$

5) C

A) $\frac{25z^{10}}{64x^{10}y^{10}}$

B) $\frac{25y^{10}}{64x^{10}z^{10}}$

C) $\frac{25y^{10}z^{10}}{64x^{10}}$

D) $\frac{64x^{10}}{25y^{10}z^{10}}$

Objective: (9.1) Use the Laws of Exponents

Multiply.

6) $-4x^6(-8x^5 - 1) = 32x^{11} + 4x^6$

6) C

A) $36x^6$

B) $32x^{11} - 1$

C) $32x^{11} + 4x^6$

D) $32x^5 + 4$

Objective: (9.3) Multiply Polynomials

7) $(7x - 1)^2 = (7x - 1)(7x - 1) = 49x^2 - 14x + 1$

7) A

A) $49x^2 - 14x + 1$

B) $49x^2 + 1$

C) $7x^2 + 1$

D) $7x^2 - 14x + 1$

Objective: (9.3) Know Formulas for Specials Products

Factor Completely.

8) $72x^9 - 64x^6 + 80x^4 = 8x^4(9x^5 - 8x^2 + 10)$

8) C

A) $x^4(72x^5 - 64x^2 + 80)$

B) $8(9x^9 - 8x^6 + 10x^4)$

C) $8x^4(9x^5 - 8x^2 + 10)$

D) prime

Objective: (9.4) Factor the Difference of Two Squares and the Sum and the

9) $9x^2 - 49 = (3x - 7)(3x + 7)$

9) D

A) $(9x + 1)(x - 49)$

B) $(3x - 7)^2$

C) $(3x + 7)^2$

D) $(3x + 7)(3x - 7)$

Objective: (9.4) Factor the Difference of Two Squares and the Sum and the

10) $x^4 - 625 = (x^2 + 25)(x^2 - 25)$
 $= (x^2 + 25)(x + 5)(x - 5)$

10) A

A) $(x^2 + 25)(x + 5)(x - 5)$

B) $(x^2 - 25)^2$

C) $(x^2 + 25)^2$

D) prime

Objective: (9.4) Factor the Difference of Two Squares and the Sum and the

$$11) 64x^2 - 48x + 9 = (8x - 3)(8x - 3) = (8x - 3)^2$$

11) C

A) $(8x - 4)^2$

B) $(8x + 3)^2$

C) $(8x - 3)^2$

D) $(8x + 3)(8x - 3)$

Objective: (9.4) Factor Perfect Squares

$$12) 4x^2 + 12x + 9 = (2x + 3)(2x + 3)$$

12) B

A) $(4x + 3)(x + 3)$

B) $(2x + 3)(2x + 3)$

C) $(2x - 3)(2x - 3)$

D) prime

Objective: (9.4) Factor a Second-degree Polynomial: $Ax^2 + Bx + C$

$$13) 15z^2 + 2z - 8 = (3z - 2)(5z + 4)$$

13) C

A) $(15z - 2)(z + 4)$

B) $(3z + 2)(5z - 4)$

C) $(3z - 2)(5z + 4)$

D) prime

Objective: (9.4) Factor a Second-degree Polynomial: $Ax^2 + Bx + C$

$$14) 15x^3 - 37x^2 + 20x = x(15x^2 - 37x + 20) \\ = x(3x - 5)(5x - 4)$$

14) B

A) $x^2(3x - 5)(5x - 4)$

B) $x(3x - 5)(5x - 4)$

C) $x(5x - 5)(3x - 4)$

D) $(3x^2 - 5)(5x - 4)$

Objective: (9.4) Factor a Second-degree Polynomial: $Ax^2 + Bx + C$

Factor the polynomial by grouping.

$$15) (x^2 + 5x) + (2x + 10) = x(x + 5) + 2(x + 5) \\ = (x + 5)(x + 2)$$

15) C

A) $(x - 5)(x + 2)$

B) $(x - 5)(x - 2)$

C) $(x + 5)(x + 2)$

D) prime

Objective: (9.4) Factor by Grouping

$$16) (20x^2 + 16x) - (25x - 20) = 4x(5x + 4) - 5(5x - 4) \\ = (5x + 4)(4x - 5)$$

16) D

A) $(20x + 5)(x - 4)$

B) $(4x + 5)(5x - 4)$

C) $(20x - 5)(x + 4)$

D) $(4x - 5)(5x + 4)$

Objective: (9.4) Factor by Grouping

Factor completely.

$$17) (y^3 + 6y^2) - (8y^2 - 36y) = 3y^2(y + 2) - 18y(y - 2) = (y + 2)(3y^2 - 18y) = (y + 2) \cdot 3y(y - 6) \quad 17) \underline{D}$$

- A) $(y + 2)(3y^2 - 18y)$ B) $(y + 2)(y - 6) = 3y(y + 2)(y - 6)$
 C) $3y(y - 2)(y + 6)$ D) $3y(y + 2)(y - 6)$

Objective: (9.4) Factor by Grouping

Simplify the expression. Express the answer so that only positive exponents occur. Assume that all variables are positive.

$$18) x^{-2/7} \cdot x^{3/7} = x^{-2/7 + 3/7} = x^{1/7} \quad 18) \underline{A}$$

- A) $x^{1/7}$ B) $x^{7/6}$ C) $x^{-1/7}$ D) $x^{6/7}$

Objective: (9.7) Simplify Expressions with Rational Exponents

$$19) (x^{10}y^5)^{1/5} = x^{10/5} y^{5/5} = x^2 y \quad 19) \underline{B}$$

- A) $x^2 | y |$ B) $x^2 y$ C) x^2 D) $x^{10} y$

Objective: (9.7) Simplify Expressions with Rational Exponents

$$20) (9x^{14}y^{-8})^{7/2} = (\sqrt{9x^{14}y^{-8}})^7 = (3x^7y^{-4})^7 = 3^7 x^{49} y^{-28} = \frac{2187x^{49}}{y^{28}} \quad 20) \underline{C}$$

- A) $\frac{2187}{x^{49}y^{28}}$ B) $\frac{9x^{49}}{y^{28}}$ C) $\frac{2187x^{49}}{y^{28}}$ D) $2187x^{49}y^{28}$

Objective: (9.7) Simplify Expressions with Rational Exponents

Solve the equation.

$$21) \frac{6}{x-7} - \frac{2}{x+7} \quad \begin{aligned} 6(x+7) &= 2(x-7) \\ 6x+42 &= 2x-14 \\ 4x+42 &= -14 \\ 4x &= -56 \\ x &= -14 \end{aligned} \quad 21) \underline{D}$$

- A) $\{-\frac{7}{4}\}$ B) $\{14\}$ C) $\{-\frac{7}{2}\}$ D) $\{-14\}$

Objective: (9.8) Solve Rational Equations

$$22) \frac{(x+4)(x-4)}{\left(\frac{4}{x+4} - \frac{9}{x-4}\right)} = \frac{13}{(x+4)(x-4)} \quad 22) \underline{A}$$

- A) $\{-13\}$ B) $\{65\}$ C) $\{39\}$ D) $\{13\}$

Objective: (9.8) Solve Rational Equations

$$\begin{aligned} 4(x-4) - 9(x+4) &= 13 \\ 4x - 16 - 9x - 36 &= 13 \\ -5x - 52 &= 13 \\ -5x &= 65 \\ x &= -13 \end{aligned}$$

23) $x^2 + 6x = 0$

$x(x+6) = 0$
 $x=0 \quad x=-6$

A) $\{-6\}$

B) $\{0, 6\}$

C) $\{6\}$

D) $\{0, -6\}$

Objective: (9.8) Solve Quadratic Equations by Factoring

23) D

24) $x^3 + x^2 - 6x = 0$

$x(x^2 + x - 6) = 0$
 $x(x+3)(x-2) = 0$
 $x=0 \quad x=-3 \quad x=2$

A) $\{-3, -2, 0\}$

B) $\{-3, 0, 2\}$

C) $\{0, 2, 3\}$

D) $\{-2, 0, 3\}$

Objective: (9.8) Solve Quadratic Equations by Factoring

24) B

Perform the indicated operations and express your answer in the form $a + bi$.

25) $\sqrt{-64} = \sqrt{64 \cdot -1} = \sqrt{64} \cdot \sqrt{-1} = 8i$

A) ~~$-8i$~~

B) ± 8

C) $i\sqrt{8}$

D) $8i$

Objective: (9.11) Add, Subtract, Multiply, and Divide Complex Numbers

25) D

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

26) $-7i(-3 + 7i) = +21i - 49i^2 = 21i + 49$

A) $-49 + 21i$

B) $21i - 49i^2$

C) $49 + 21i$

D) $21i + 49i^2$

Objective: (9.11) Add, Subtract, Multiply, and Divide Complex Numbers

26) C

27) $\frac{7}{2-i} \cdot \frac{2+i}{2+i} = \frac{7(2+i)}{4-i^2} = \frac{14+7i}{5} = \frac{14}{5} + \frac{7}{5}i$

A) $\frac{14}{3} - \frac{7}{3}i$

B) $\frac{14}{5} - \frac{7}{5}i$

C) $\frac{14}{3} + \frac{7}{3}i$

D) $\frac{14}{5} + \frac{7}{5}i$

Objective: (9.11) Add, Subtract, Multiply, and Divide Complex Numbers

27) D