

1. Perform the indicated operation.

$$(6x^3 - 3x^2 + 2x - 7) - (4x^3 - 5x^2 - 5x + 6)$$

Write the polynomial in standard form.

$$(6x^3 - 3x^2 + 2x - 7) - (4x^3 - 5x^2 - 5x + 6) = \underline{\hspace{2cm}}$$

What is the degree of the polynomial?

(Type a whole number.)

2. Simplify the exponential expression. Assume that variables represent nonzero real numbers.

$$(3x^{-7}yz^{-4})(3x)^{-5}$$

$$(3x^{-7}yz^{-4})(3x)^{-5} = \underline{\hspace{2cm}} \text{ (Simplify your answer. Use positive exponents only.)}$$

3. Divide as indicated.

$$\frac{y^2 - 64}{y} \div \frac{y + 8}{y - 8}$$

Select the correct choice below and fill in the answer box(es) to complete your choice.

(Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

A. $\frac{y^2 - 64}{y} \div \frac{y + 8}{y - 8} = \underline{\hspace{2cm}}$, $y \neq \underline{\hspace{2cm}}$

B. $\frac{y^2 - 64}{y} \div \frac{y + 8}{y - 8} = \underline{\hspace{2cm}}$, no numbers must be excluded.

4. Subtract.

$$\frac{5}{x+1} - \frac{5}{x}$$

Select the correct choice below and fill in any answer boxes within your choice.

(Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

A. $\frac{5}{x+1} - \frac{5}{x} = \underline{\hspace{2cm}}$, $x \neq \underline{\hspace{2cm}}$

B. $\frac{5}{x+1} - \frac{5}{x} = \underline{\hspace{2cm}}$, no numbers must be excluded.

5. Find the intersection of the following sets.

$$\{b,x,j\} \cap \{j,x,b\}$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $\{b,x,j\} \cap \{j,x,b\} = \{ \quad \quad \quad \}$
(Use a comma to separate answers as needed.)
- B. $\{b,x,j\} \cap \{j,x,b\} = \emptyset$

6. Simplify the given exponential expression.

$$(x^{-3})^3$$

$$(x^{-3})^3 = \underline{\hspace{2cm}} \text{ (Type exponential notation with positive exponents.)}$$

7. Write the number in scientific notation.

$$0.00012$$

$$0.00012 = \underline{\hspace{2cm}}$$

(Use the multiplication symbol in the math palette as needed.)

8. Simplify using properties of exponents.

$$(x^{5/9})^9$$

$$(x^{5/9})^9 = \underline{\hspace{2cm}}$$

9. Simplify the given expression.

$$\sqrt{(-12)^2}$$

Select the correct choice below and fill in any answer boxes to complete your choice.

- A. The expression is a real number. $\sqrt{(-12)^2} = \underline{\hspace{2cm}}$ (Simplify your answer.)
- B. The expression is not a real number.

10. Multiply using the rule for the square of a binomial.

$$(x-7)^2$$

$$(x-7)^2 = \underline{\hspace{2cm}}$$

11. Write the English phrase as an algebraic expression. Then simplify the expression. Let x represent the number.

The difference between three times a number and four more than two times the number.

What is the algebraic expression?

(Do not simplify.)

What is the simplified expression?

12. Rationalize the denominator.

$$\frac{5}{\sqrt{2}-1}$$

$$\frac{5}{\sqrt{2}-1} = \underline{\hspace{2cm}}$$

(Simplify your answer. Type an exact answer, using radicals as needed.)

13. Factor the following by grouping.

$$x^3 - 2x^2 + 7x - 14$$

Select the correct choice below and, if necessary, fill in the answer box to complete your choice.

- A. $x^3 - 2x^2 + 7x - 14 = \underline{\hspace{2cm}}$
- B. The polynomial is prime.

14. Factor the given polynomial.

$$x^2 + 7x + 10$$

Select the correct choice below and, if necessary, fill in the answer box within your choice.

- A. $x^2 + 7x + 10 = \underline{\hspace{2cm}}$
- B. The polynomial is prime.

15. Write the given algebraic expression without parentheses.

$$-(6x - 8y - 7)$$

$$-(6x - 8y - 7) = \underline{\hspace{2cm}}$$

16. Evaluate the given algebraic expression for $x = 3$ and $y = -1$.

$$|x| + |y|$$

The answer is .

(Type an integer.)

17. Find the product.

$$(6x + 7)(x^2 - 8x + 6)$$

$$(6x + 7)(x^2 - 8x + 6) = \underline{\hspace{2cm}}$$

(Simplify your answer.)

18. Find all numbers that must be excluded from the domain of the rational expression.

$$\frac{x - 5}{x^2 + 8x + 7}$$

Type the values for which the rational expression is undefined. Select the correct choice below and fill in any answer boxes within your choice.

- A. (Use a comma to separate answers as needed.)
- B. The rational expression is defined for all real numbers.
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19. Factor the greatest common factor from the polynomial.

$$12x^2 + 16x$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. $12x^2 + 16x = \underline{\hspace{2cm}}$
- B. The polynomial is prime.
-

20. Factor the difference of two squares.

$$4x^2 - 81$$

Select the correct choice below and fill in any answer boxes within your choice.

- A. $4x^2 - 81 = \underline{\hspace{2cm}}$
- B. The polynomial is prime.
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21. Multiply using the rule for the product of the sum and difference of two terms.

$$(5x + 7)(5x - 7)$$

$$(5x + 7)(5x - 7) = \underline{\hspace{2cm}}$$

22. Add as indicated.

$$\frac{4}{5x+20} + \frac{3}{2x+8}$$

Select the correct choice below and fill in the answer box(es) to complete your choice.

(Simplify your answer. Use integers or fractions for any numbers in the expression. Use a comma to separate answers as needed.)

A. $\frac{4}{5x+20} + \frac{3}{2x+8} =$ _____, no numbers must be excluded.

B. $\frac{4}{5x+20} + \frac{3}{2x+8} =$ _____, $x \neq$ _____

1. $2x^3 + 2x^2 + 7x - 13$

3

2. $\frac{y}{81x^{12}z^4}$

3. A. $\frac{y^2 - 64}{y} \div \frac{y + 8}{y - 8} = \frac{(y - 8)^2}{y}$, $y \neq$ 0, 8, -8

4. A. $\frac{5}{x + 1} - \frac{5}{x} = -\frac{5}{x(x + 1)}$, $x \neq$ 0, -1

5. A. $\{b, x, j\} \cap \{j, x, b\} = \{$ b, x, j $\}$ (Use a comma to separate answers as needed.)

6. $\frac{1}{x^9}$

7. 1.2×10^{-4}

8. x^5

9. A. The expression is a real number. $\sqrt{(-12)^2} =$ 12 (Simplify your answer.)

10. $x^2 - 14x + 49$

11. $3x - (2x + 4)$

$x - 4$

12. $5\sqrt{2} + 5$

13. A. $x^3 - 2x^2 + 7x - 14 = \underline{(x^2 + 7)(x - 2)}$

14. A. $x^2 + 7x + 10 = \underline{(x + 5)(x + 2)}$

15. $-6x + 8y + 7$

16. 4

17. $6x^3 - 41x^2 - 20x + 42$

18. A. -1, -7 (Use a comma to separate answers as needed.)

19. A. $12x^2 + 16x = \underline{4x(3x + 4)}$

20. A. $4x^2 - 81 = \underline{(2x + 9)(2x - 9)}$

21. $25x^2 - 49$

22. B. $\frac{4}{5x+20} + \frac{3}{2x+8} = \underline{\frac{23}{10(x+4)}}$, $x \neq \underline{-4}$
