

1. Simplify.

$$|-15|$$

$$|-15| = \boxed{15} \text{ (Simplify your answer.)}$$

2. Find the least common multiple (LCM) for the following pair of numbers.

14 and 18

$$\text{The least common multiple is } \boxed{126}.$$

3. Combine. Be sure to simplify your answer whenever possible.

$$\frac{4}{5} - \frac{3}{4}$$

$$\frac{4}{5} - \frac{3}{4} = \boxed{\frac{1}{20}} \text{ (Type an integer or a simplified fraction.)}$$

4. Divide.

$$\frac{14}{15} \div 4\frac{1}{3}$$

$$\frac{14}{15} \div 4\frac{1}{3} = \boxed{\frac{14}{65}}$$

(Type a whole number or a simplified fraction.)

5. Evaluate the algebraic expression for $x = 6$.

$$x^2 - 6$$

$$\text{The answer is } \boxed{30}.$$

6. Simplify the expression.

$$6x^4 + 8x^4 - 9x^4$$

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

☒ **A.** $6x^4 + 8x^4 - 9x^4$ simplifies to $\boxed{5x^4}$. (Simplify your answer.)

☐ **B.** The expression cannot be simplified.

7. Write the statement as an inequality.

A number is no more than -6 .

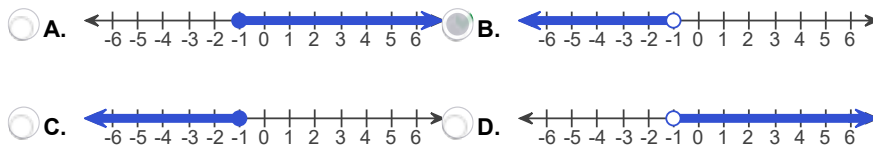
$$\text{The inequality is } \boxed{y \leq -6}.$$

(Type an inequality using y as the variable.)

8. Graph the inequality on a number line. Then write the solution using interval notation.

$$x < -1$$

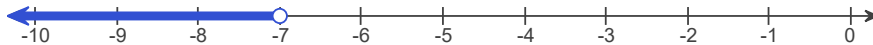
Choose the graph of $x < -1$.



Which of the following represents the inequality $x < -1$ using interval notation?

- ☐ A. $(-\infty, -1]$
☐ B. $(-1, \infty)$
☒ C. $(-\infty, -1)$
☐ D. $[-1, \infty)$

9. Write the following interval in interval notation.



The graph represents the interval .

(Type your answer in interval notation. Use integers or fractions for any numbers in the expression.)

10. Rewrite the polynomial in descending order. Identify the degree of the polynomial, the leading term, and the leading coefficient.

$$26 - 6r^4 + 2r - 3r^2$$

The polynomial in descending order is .

The degree of the polynomial is .

What is the leading term of the polynomial?

- ☐ A. $2r$ ☐ B. $-3r^2$
☐ C. 26 ☒ D. $-6r^4$

The leading coefficient of the polynomial is .

11. Identify the polynomial as a monomial, binomial, or trinomial.

$$x^2 - 17x + 90$$

Choose the correct answer below.

- ☐ binomial
☐ monomial
☒ trinomial

12. Add the polynomials.

$$(6x^2 + 5x - 7) + (4x^2 - 6x - 13)$$

$$(6x^2 + 5x - 7) + (4x^2 - 6x - 13) = 10x^2 - x - 20 \text{ (Simplify your answer.)}$$

13. Subtract the polynomials.

$$(4x^2 - 7x - 30) - (2x^2 - 10x + 48)$$

$$(4x^2 - 7x - 30) - (2x^2 - 10x + 48) = 2x^2 + 3x - 78 \text{ (Simplify your answer.)}$$

14. Multiply.

$$(x + 9)(3x - 4)$$

$$(x + 9)(3x - 4) = 3x^2 + 23x - 36 \text{ (Simplify your answer.)}$$

15. Multiply.

$$(3c + 4)(3c - 4)$$

$$(3c + 4)(3c - 4) = 9c^2 - 16 \text{ (Simplify your answer.)}$$

16. Find the special product using the appropriate formula.

$$(4x - 7)^2$$

$$(4x - 7)^2 = 16x^2 - 56x + 49$$

(Simplify your answer.)

17. Factor the GCF out of the following expression.

$$a^7b^4 - a^4b^7 + a^7b^6$$

$$a^7b^4 - a^4b^7 + a^7b^6 = a^4b^4(a^3 - b^3 + a^3b^2)$$

(Type exponential notation with positive exponents.)

18. Factor completely

$$v^2 + 3v - 18$$

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

☒ **A.** The answer is $(v + 6)(v - 3)$.

☐ **B.** The expression is prime.

19. Factor completely.

$$8x^2 - 10x - 25$$

$$8x^2 - 10x - 25 = (4x + 5)(2x - 5)$$

20. Factor by grouping.

$$x^3 - 7x^2 + 4x - 28$$

$$x^3 - 7x^2 + 4x - 28 = (x - 7)(x^2 + 4)$$

21. Factor the following polynomial by grouping.

$$6x^3 + 24x^2 - 7x - 28$$

$$6x^3 + 24x^2 - 7x - 28 = (x + 4)(6x^2 - 7) \text{ (Factor completely.)}$$

22. Factor the following binomial completely. If the binomial is prime, say so.

$$z^2 - 121$$

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

☒ A. $z^2 - 121 = (z - 11)(z + 11)$

☐ B. The polynomial is prime.

23. Factor the sum of two cubes.

$$w^3 + d^3$$

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

☒ A. $w^3 + d^3 = (w + d)(w^2 - wd + d^2)$
(Type your answer in factored form.)

☐ B. The polynomial is prime.

24. Factor completely.

$$a^6b^7 - 7a^6b^6 + 9a^4b^{11}$$

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

☒ A. $a^6b^7 - 7a^6b^6 + 9a^4b^{11} = a^4b^6(a^2b - 7a^2 + 9b^5)$

☐ B. The expression is prime.

25. Factor completely. If the polynomial cannot be factored, state that it is prime.

$$5y^2 + 3y + 9$$

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

☐ A. $5y^2 + 3y + 9 =$

☒ B. The polynomial is prime.

26. Add.

$$\frac{7}{1+v} + \frac{4}{1+v}$$

$$\frac{7}{1+v} + \frac{4}{1+v} = \frac{11}{1+v}$$

(Simplify your answer.)

27. Subtract.

$$\frac{5}{a^2 - 8a + 7} - \frac{6}{a^2 - 3a - 28}$$

$$\frac{5}{a^2 - 8a + 7} - \frac{6}{a^2 - 3a - 28} = \frac{26 - a}{(a - 1)(a - 7)(a + 4)}$$

(Simplify your answer. Type your answer in factored form.)

28. Simplify.

$$\sqrt{49}$$

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

☒ A. The principal square root is . (Type an integer or a decimal.)

☐ B. The square root is not a real number.

29. Simplify the radical expression. Where appropriate, include absolute values.

$$\sqrt{\frac{1}{25}x^{34}}$$

$$\sqrt{\frac{1}{25}x^{34}} = \frac{|x^{17}|}{5}$$

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

30. Simplify by factoring.

$$\sqrt{150}$$

$$\sqrt{150} = 5\sqrt{6}$$

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

31. Simplify the radical expression. Assume all variables represent nonnegative real numbers.

$$\sqrt[3]{b^{31}}$$

$$\sqrt[3]{b^{31}} = b^{10}\sqrt[3]{b}$$

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

32. Simplify.

$$\sqrt{2} \cdot \sqrt{50}$$

$$\sqrt{2} \cdot \sqrt{50} = 10$$

(Simplify your answer.)

33. Simplify.

$$\frac{\sqrt{12}}{\sqrt{3}}$$

$$\frac{\sqrt{12}}{\sqrt{3}} = 2$$

(Simplify your answer.)

34. Simplify the given expression.

$$4\sqrt{2} + 7\sqrt{2}$$

$$4\sqrt{2} + 7\sqrt{2} = \boxed{11\sqrt{2}} \text{ (Type an exact answer, using radicals as needed.)}$$

35. Subtract. Assume all variables represent nonnegative real numbers.

$$3\sqrt{x} - 6\sqrt{x}$$

$$3\sqrt{x} - 6\sqrt{x} = \boxed{-3\sqrt{x}}$$

36. Rewrite as a radical expression using rational exponents.

$$36^{1/2}$$

$$36^{1/2} = \boxed{6}$$

(Simplify your answer. Type an integer or a fraction.)

37. Simplify the expression. Assume that all variables represent nonnegative real numbers. Express your answer in radical notation.

$$\sqrt[5]{y} \cdot \sqrt{y}$$

$$\sqrt[5]{y} \cdot \sqrt{y} = \boxed{\sqrt[10]{y^7}}$$

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

38. Simplify the expression. Assume that all variables represent nonnegative real numbers. Express the answer in radical notation.

$$\frac{\sqrt[90]{x}}{\sqrt[9]{x}} \quad (x \neq 0)$$

$$\frac{\sqrt[90]{x}}{\sqrt[9]{x}} = \boxed{\frac{1}{\sqrt[10]{x}}}$$