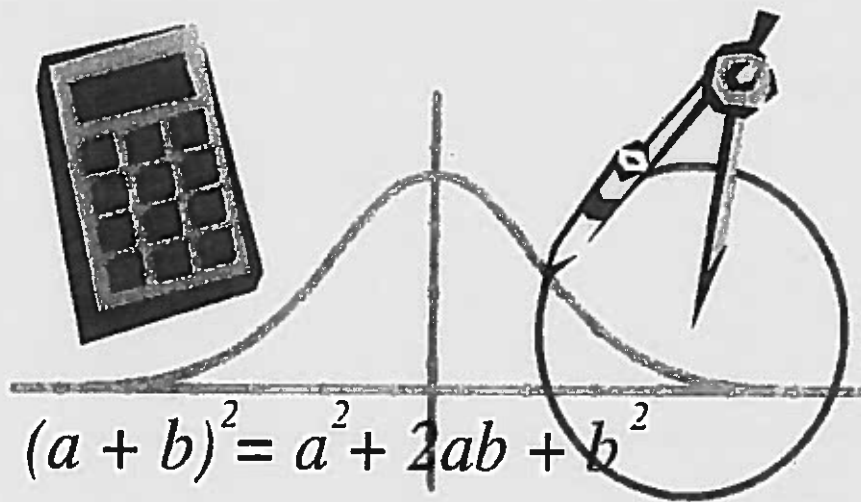


Keystone Algebra I Review
Day 1
Operations with Real Numbers and
Expressions



1. Evaluate the following expression for $m = 9$.

$$\sqrt{4m+5}$$

- A. 7
- B. 11
- C. 1
- D. 17

2. Simplify the following expression.

$$8^4 \cdot 8^3$$

- A. $8(12)$
- B. 8^7
- C. 8^{12}
- D. $8(7)$

3. Simplify: $7\sqrt{54} - 2\sqrt{24}$

- A. $25\sqrt{6}$
- B. $9\sqrt{6}$
- C. $17\sqrt{6}$
- D. $55\sqrt{6}$

4. The expression below should be further simplified for which value of x ?

$$\sqrt{85x}$$

- A. 185
- B. 53
- C. 74
- D. 3

5. Factor the following polynomial completely.

$$-0.9x^2 - 4.5x + 12.6$$

- A. $-0.9(x + 7)(x + 2)$
- B. $0.9(x + 7)(x - 2)$
- C. $-0.9(x^2 + 5x - 14)$
- D. $-0.9(x + 7)(x - 2)$

6. Order the following from least to greatest.

$$\frac{2}{3}, 0.56, 14\%, 77\%, \frac{1}{2}$$

- A. $\frac{1}{2}, \frac{2}{3}, 0.56, 14\%, 77\%$
- B. $14\%, \frac{1}{2}, 0.56, \frac{2}{3}, 77\%$
- C. $14\%, \frac{1}{2}, \frac{2}{3}, 77\%, 0.56$
- D. $77\%, \frac{2}{3}, 0.56, \frac{1}{2}, 14\%$

7. The Rose Theater seats 146 people, and the theater is hosting a play for 8 nights. If the theater is at about 80% capacity for each night of the play, approximately how many people will attend the play?

- A. 1168
- B. 934
- C. 123
- D. 1176

8. Mick is participating in a cross county bike race. Every 2 hours he travels between 38 and 50 miles. Four hours ago, Mick had traveled 52 miles from the start of the race. Which is a reasonable measure of Mick's distance from the start of the race now?

- A. 158 miles
- B. 142 miles
- C. 166 miles
- D. 118 miles

9. Evaluate the following expression when $n = 2$.

$$2|3 - 6n| + |2|$$

- A. 20
- B. 16
- C. -20
- D. -16

10. Simplify the following expression.

$$\frac{3x^3 + 18x^2 - 15x}{3x}$$

- A. $3x^3 + 18x^2 - 5$
- B. $x^2 + 6x - 5$
- C. $19x^2 + 5x$
- D. $x^2 + 15x - 12$

11. Simplify: $(7x^2 + 6x + 3) - (2x^2 - 3x + 7)$

- A. $9x^2 + 9x - 4$
- B. $5x^2 + 9x - 4$
- C. $9x^2 + 9x - 10$
- D. $5x^2 + 3x - 4$

12. Factor the following polynomial.

$$16x^2 + 20x$$

- A. $4x(4x + 20)$
- B. $4x^2(4x + 5)$
- C. $4x(4x + 5)$
- D. $4(4x + 5)$

13. Factor the following expression completely.

$$x^4 - 1$$

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

14. First State Bank has a drive-thru for customers who are making withdrawals or deposits. The drive-thru is open 5 days a week for 8 hours per day. Every hour, the bank serves 4 to 8 drive-thru customers. If two-thirds of drive-thru customers make a deposit, then about how many drive-thru customers will make a deposit in one work week?

- A. 160 drive-thru customers
- B. 80 drive-thru customers
- C. 20 drive-thru customers
- D. 224 drive-thru customers

15. Simplify: $4(13 - |-9 + 4|) - |9 - 7|^2$

- A. -4
- B. 28
- C. 43
- D. 16

16. Evaluate the following expression when $r = 3$ and $t = 2$.

$$(2 \times r^t)^{-2}$$

- A. $\frac{4}{81}$
- B. -36
- C. $\frac{1}{2}$
- D. $\frac{1}{324}$

17. Simplify: $(6x^2 - 8x - 1)(2x - 5)$

- A. $12x^3 - 46x^2 + 38x - 5$
- B. $12x^3 - 14x^2 - 42x + 5$
- C. $12x^3 + 14x^2 - 42x - 5$
- D. $12x^3 - 46x^2 + 38x + 5$

18. What is the greatest common factor (GCF) of the monomials shown below?

$$14x^3y^3z^2 \quad 22xy^2$$

- A. $2xy^2$
- B. $2x^3y^3z^2$
- C. $154x^4y^5z^2$
- D. $154x^3y^3z^2$

19. Look at the two monomials below.

$$6u^2v^2w^3 \quad 10u^3vw^4$$

What is the least common multiple (LCM) of the monomials shown above?

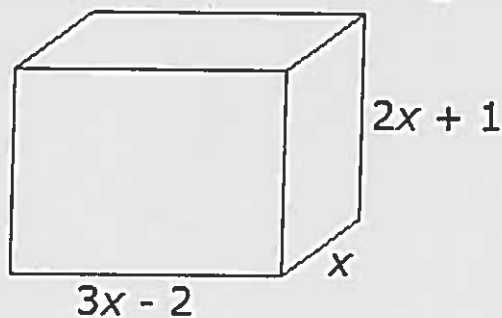
- A. $30u^3v^2w^4$
- B. $30u^5v^3w^7$
- C. $2u^5v^3w^7$
- D. $2u^2vw^3$

20. Simplify the following expression.

$$\frac{2x^2 + 12x + 16}{2x^2 + 4x - 16}$$

- A. $\frac{2x + 4}{x + 2}$
- B. $\frac{x + 2}{x - 2}$
- C. $\frac{x - 2}{2x - 1}$
- D. $\frac{x - 2}{x + 4}$

21. Alena is packing a box that has a height of one inch more than twice the width and a length of two inches less than three times the width, as shown in the diagram below.



A. Write a polynomial expression, in simplified form, that represents the volume of the box.

B. Alena packs another box. This box has a square base with an area of $9x^2 - 6x + 1$ square inches. Write an expression to represent one side length of the base.

C. Alena has a third box whose height is the same as the first box, but whose volume is $6x^3 + 15x^2 + 6x$ cubic inches. Determine how much wider and longer this box is than the first box. Assume that the length of the box has a larger coefficient than the width. Show all your work. Explain why you did each step.

