

Chapter 3 – FACTORS & PRODUCTS- EXAM REVIEW

Factor Master: _____

Selective Response Questions (13 points):

Read each question carefully and decide which one of the responses best answers the question being asked.

1. Write the prime factorization of 4116.

- A. $2 \cdot 3^2 \cdot 7^3$ B. $2^2 \cdot 3 \cdot 7^3$ C. $2^2 \cdot 3 \cdot 7^2$ D. $2^3 \cdot 3 \cdot 7^2$

2. Determine the greatest common factor of 48, 72, and 108.

- A. 31 104 B. 432 C. 12 D. 216

3. Determine the least common multiple of 48, 72, and 108.

- A. 31 104 B. 432 C. 12 D. 216

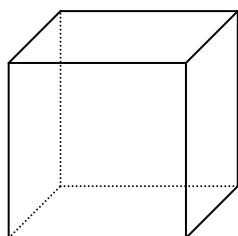
4. A developer wants to subdivide a rectangular plot of land measuring 600 m by 750 m into congruent square lots. What is the side length of the largest possible square?

- A. 75 m B. 150 m C. 50 m D. 30 m

5. Which of the following numbers is not both a perfect square and a perfect cube?

- A. 531 441 B. 15 625 C. 12 544 D. 117 649

6. Determine the edge length of this cube.



Volume
= 91 125 cm³

- A. 301.87 cm B. 45 cm C. 3375 cm D. 6.71 cm

7. Expand and simplify: $(6p + 3)(6p - 7) - (7p - 4)(p - 2)$

- A. $29p^2 - 42p - 13$ B. $29p^2 - 6p - 29$ C. $29p^2 - 6p - 13$ D. $29p^2 - 42p - 29$

8. Factor the trinomial $-42x^5y^6 - 24x^4y^5 - 54x^3y^7$.

- A. $-6x^3(7x^2y^6 + 4xy^5 + 9y^7)$ B. $6x^4y^5(-7xy - 4 - 9y^2)$
C. $-6x^3y^5(7x^2y + 4x + 9y^2)$ D. $-3x^3y^5(14x^2y + 8x + 18y^2)$

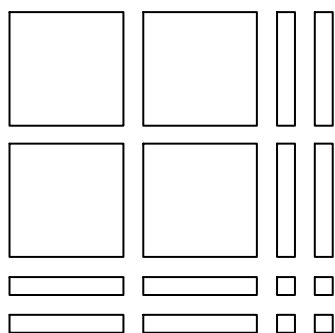
9. Complete: $(a + 6)(a - \square) = a^2 + \square a - 12$

- A. $(a + 6)(a - 4) = a^2 + 2a - 12$ B. $(a + 6)(a - 4) = a^2 + 4a - 12$
C. $(a + 6)(a - 2) = a^2 + 2a - 12$ D. $(a + 6)(a - 2) = a^2 + 4a - 12$

10. Expand and simplify: $(5m - 3n)^2$

- A. $25m^2 - 9n^2$ B. $25m^2 - 30mn + 9n^2$ C. $25m^2 + 9n^2$ D. $25m^2 - 15mn + 9n^2$

11. Which multiplication sentence does this set of algebra tiles represent?



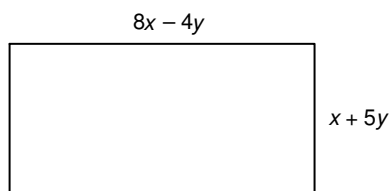
- A. $(2x - 2)(2x + 2)$ B. $(2x + 2)(2x + 2)$ C. $(2x^2 + 2)(2x^2 + 2)$ D. $(2x^2 + 2x)(2x^2 + 2x)$

12. Expand and simplify: $(f + 5g)(2f - 5g + 7)$

- A. $2f^2 - 15fg + 7f - 25g^2 + 35g$
 C. $2f^2 + 5fg + 7f + 25g^2 + 35g$

- B. $2f^2 + 5fg + 7f - 25g^2 + 35g$
 D. $2f^2 - 5fg + 7f - 25g^2 + 35g$

13. Which polynomial, written in simplified form, represents the area of this rectangle?



- A. $16x^2 + 72xy - 40y^2$
 C. $8x^2 + 36xy - 20y^2$

- B. $8x^2 + 22xy - 20y^2$
 D. $8x^2 - 36xy - 20y^2$

Constructed Response Questions (21 points):

Read each question carefully. Be sure to write your response in the space provided. Points will be awarded for your correct work and your correct final answer. The method used to solve a problem must clearly be shown.

14. Suppose you must use $2x^2$ -tiles and $7x$ -tiles. Find the number of 1-tiles could you use to form a rectangle? Only one rectangle is required. YOU MUST **DRAW YOUR RECTANGLE**. Write the **factors** of the rectangle (2 points)

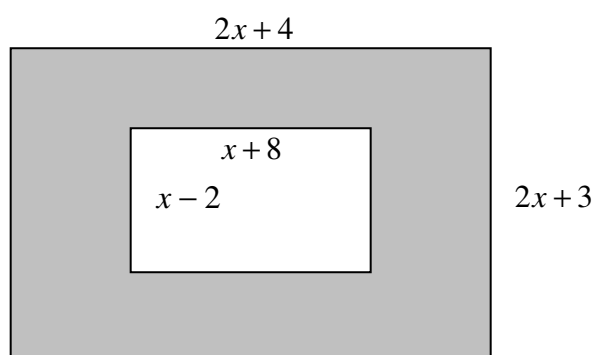
15. Fully factor the following polynomials: (10 points)

- a) $22n^2 + n - 5$ b) $14z^2 - 49z + 35$ c) $4x^2 + 12x + 9$ d) $49s^2 - 64t^2$ e) $a^2 + 10a + 25$

16. Find and correct the error(s) in this solution of factoring by decomposition. YOU MUST STATE THE ERROR(S) AND THE CORRECTION. (2 points)

$$\begin{aligned} 90y^2 + 77y - 52 &= 90y^2 + 117y - 40y - 52 \\ &= 9y(10y + 13) + 4(10y + 13) \\ &= (10y + 13)(9y + 4) \end{aligned}$$

17. A picture and its frame have dimensions as shown. (3 points)



- a) Find an expression for the area of the frame.
 b) Determine the area of the frame when $x=15\text{cm}$.

18. The area of a square is represented by the trinomial $36m^2 + 84mn + 49n^2$. Determine an expression for the perimeter of the square. (2 points)

19. A square is drawn inside a circle with radius $11x$. Write an expression for the area of the shaded region. (2 points)

