REVIEW

3.1

1. Determine the prime factors of each number, then write the number as a product of its factors.

a) 594 **b)** 2100

c) 4875 **d)** 9009

2. Determine the greatest common factor of each set of numbers.

a) 120, 160, 180 **b)** 245, 280, 385

c) 176, 320, 368 **d)** 484, 496, 884

3. Determine the least common multiple of each set of numbers.

a) 70, 90, 140 **b)** 120, 130, 309

c) 200, 250, 500 **d)** 180, 240, 340

4. A necklace has 3 strands of beads. Each strand begins and ends with a red bead. If a red bead occurs every 6th bead on one strand, every 4th bead on the second strand, and every 10th bead on the third strand, what is the least number of beads each strand can have?

5. Simplify. How did you use the greatest common factor or the least common multiple?

a) $\frac{1015}{1305}$ **b)** $\frac{2475}{3825}$

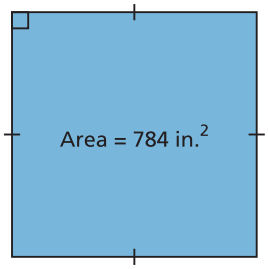
c) $\frac{6656}{7680}$ **d)** $\frac{7}{36} + \frac{15}{64}$

e) $\frac{5}{9} \div \frac{3}{4}$ **f)** $\frac{28}{128} - \frac{12}{160}$

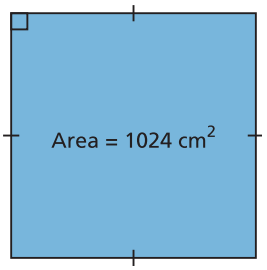
3.2

6. How do you know that the area of each square is a perfect square? Determine the side length of each square.

a)

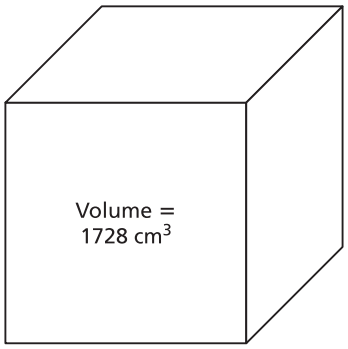


b)

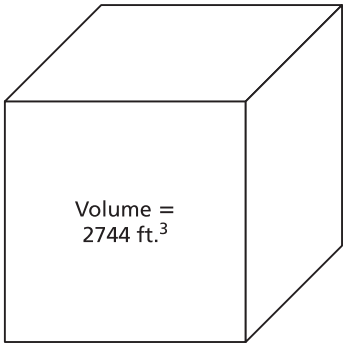


7. How do you know that the volume of each cube is a perfect cube? Determine the edge length of each cube.

a)



b)



8. Is each number a perfect square, a perfect cube, or neither? Determine the square root of each perfect square and the cube root of each perfect cube.

a) 256 **b)** 324

c) 729 **d)** 1298

e) 1936 **f)** 9261

9. A square has area 18 225 square feet. What is the perimeter of the square?

10. A cube has surface area 11 616 cm^2. What is the edge length of the cube?

3.3

11. Factor each binomial. For which binomials could you use algebra tiles to factor? Explain why you could not use algebra tiles to factor the other binomials.

a) $8m - 4m^2$
b) $-3 + 9g^2$
c) $28a^2 - 7a^3$
d) $6a^2b^3c - 15a^2b^2c^2$
e) $-24m^2n - 6mn^2$
f) $14b^3c^2 - 21a^3b^2$

12. Factor each trinomial. Verify that the factors are correct.

a) $12 + 6g - 3g^2$
b) $3c^2d - 10cd - 2d$
c) $8mn^2 - 12mn - 16m^2n$
d) $y^4 - 12y^2 + 24y$
e) $30x^2y - 20x^2y^2 + 10x^3y^2$
f) $-8b^3 + 20b^2 - 4b$

13. Factor each polynomial. Verify that the factors are correct.

a) $8x^2 - 12x$
b) $3y^3 - 12y^2 + 15y$
c) $4b^3 - 2b - 6b^2$
d) $6m^3 - 12m - 24m^2$

14. Find and correct the errors in each factorization.

a) $15p^2q + 25pq^2 - 35q^3$
$= 5(3p^2q + 5pq^2 - 7q^3)$
b) $-12mn + 15m^2 + 18n^2$
$= -3(-4mn + 15m^2 + 18n^2)$

3.4

15. Use algebra tiles. Sketch the tiles for each trinomial that can be arranged as a rectangle.

a) $x^2 + 8x + 12$
b) $x^2 + 7x + 10$
c) $x^2 + 4x + 1$
d) $x^2 + 8x + 15$

16. Use algebra tiles. Sketch the tiles for each trinomial that can be arranged as a rectangle.

a) $2k^2 + 3k + 2$
b) $3g^2 + 4g + 1$
c) $2t^2 + 7t + 6$
d) $7h^2 + 5h + 1$

17. Suppose you have one x^2-tile and five 1-tiles. What is the fewest number of x-tiles you need to arrange the tiles in a rectangle?

3.5

18. Expand and simplify. Sketch a rectangle diagram to illustrate each product.

a) $(g + 5)(g - 4)$
b) $(h + 7)(h + 7)$
c) $(k - 4)(k + 11)$
d) $(9 + s)(9 - s)$
e) $(12 - t)(12 - t)$
f) $(7 + r)(6 - r)$
g) $(y - 3)(y - 11)$
h) $(x - 5)(x + 5)$

19. Factor. Check by expanding.

a) $q^2 + 6q + 8$
b) $n^2 - 4n - 45$
c) $54 - 15s + s^2$
d) $k^2 - 9k - 90$
e) $x^2 - x - 20$
f) $12 - 7y + y^2$

20. **a)** Factor each trinomial.

i) $m^2 + 7m + 12$
ii) $m^2 + 8m + 12$
iii) $m^2 + 13m + 12$
iv) $m^2 - 7m + 12$
v) $m^2 - 8m + 12$
vi) $m^2 - 13m + 12$

b) Look at the trinomials and their factors in part a. Are there any other trinomials that begin with m^2, end with $+12$, and can be factored? If your answer is yes, list the trinomials and their factors. If your answer is no, explain why there are no more trinomials.

21. Find and correct the errors in each factorization.

a) $u^2 - 12u + 27 = (u + 3)(u + 9)$
b) $v^2 - v - 20 = (v - 4)(v + 5)$
c) $w^2 + 10w - 24 = (w + 4)(w + 6)$

3.6

22. Use algebra tiles to determine each product. Sketch the tiles to show how you used them.

a) $(h + 4)(2h + 2)$
b) $(j + 5)(3j + 1)$
c) $(3k + 2)(2k + 1)$
d) $(4m + 1)(2m + 3)$