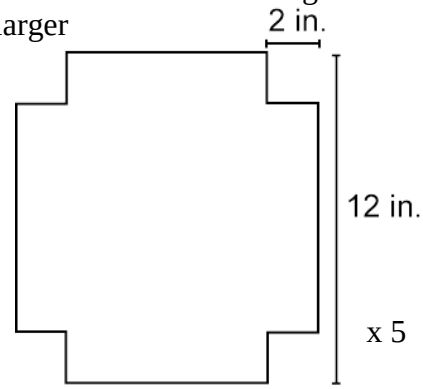
Supplemental Worksheet: EAGLE Problem Set 1—Number and Algebra Strand

1. Which statement best describes the number $\sqrt{2}$?
   a. It is a whole number but not an integer number.
   b. It is an integer but not a rational number number
   c. It is a natural number but not a whole number
   d. It is an irrational number but not a natural number
2. Use the set of numbers {0, 0.5, 1, 2, 4} to answer this question: Which name best describes this set of numbers?
   a. Integers numbers
   b. whole numbers
   c. natural numbers
   d. rational numbers
3. The difference between the number of purchases at an art gallery during one month and the number of purchases during the next month must be an integer. Which statement must also be true of this number?
   a. It is also a whole number
   b. b. It is also a natural number
   c. It is also a rational number
   d. It is also an irrational number
4. Which set contains only whole numbers?
   a. {0, 3, 5, 7}
   b. {1, ½ , 4/3, 4}
   c. {2, 3, $\sqrt{5}$, 8}
   d. {-4, -1, 2, 9}
5. Which statement below is true?
   a. -3 is an integer
   b. -5 is a natural number
   c. ¾ is an irrational number
   d. $\sqrt{10}$ is a rational number
6. Use the diagram shown to answer this question. Eli cut 2-inch squares from each corner of a larger square. Which expression can be used to find the remaining area of the larger square?



   a. $12^2 - 2^2$
   b. b. $12^2 - 2 \times 2^2$
   c. $12^2 - 4 \times 2^2$
   d. $12^2 - (4 \times 2)^2$
7. Which expression shows another way of writing the expression: 5 x 5 x 8 x 8 x 9 x 9
   a. $5^3 + 8^2 + 9^2$
   b. $5^3 \times 8^2 \times 9^2$
   c. 555 x 88 x 99
   d. 5 x 3 + 8 x 2 + 9 x 2
8. What is the value of the expression: $(-2)^3 + (-3)^2$
   a. -17
   b. -12
   c. 0
   d. 1
9. Simplify the following expression: $6^2 - 2^3$
   a. 6
   b. 28
   c. 30
   d. 32
10. Kyle rode his bike $3\frac{2}{3}$ miles in the morning and 4 ¾ miles in the afternoon. How many miles in total did Kyle ride his bike?
    a. $7\frac{5}{12}$ miles
    b. $7\frac{7}{12}$ miles
    c. $8\frac{5}{12}$ miles
    d. $8\frac{7}{12}$ miles
11. Melissa is playing a trivia game. After 2 rounds of play, Melissa has -20 points. In the remaining rounds, she answers 7 questions correctly and 1 question incorrectly. Each correct answer is worth +25 points. Each incorrect answer is worth -10 points. What is Melissa's final score?

a. 100 points b. 145 points c. 165 points d. 205 points

12. In a survey, 2/5 of 300 people said they are in favor of a new parking garage downtown. How many people are in favor of the new parking garage?
    a. 60 people b. 75 people c. 120 people d. 150 people
13. At yesterday's ballgame, 2,842 tickets were sold. The price of each ticket was $7.50. Which amount is closest to the total amount of money received from ticket sales at yesterday's ballgame?
    a. $30,000 b. $25,000 c. $20,000 d. $15,000
14. The expression, $\frac{5}{9}(-4-32)$, changes -4°F to degrees Celsius. What is the temperature, in degrees Celsius, for -4˚F?
    a. $-15\frac{5}{9}$ ˚C b. -20˚C c. -25˚C d. $-34\frac{2}{9}$ ˚C
15. Simplify the following expression: $3\frac{1}{3} \div \left(-\frac{2}{5}\right)$
    a. $-8\frac{1}{3}$ b. $-1\frac{1}{3}$ c. $1\frac{1}{3}$ d. $8\frac{1}{3}$
16. If 4 test tubes full of a liquid weigh a total of 250 ounces (oz), what is the weight of 10 test tubes full of the liquid?
    a. 500 oz b. 625 oz c. 1,000 oz d. 2,500 oz
17. Simplify the expression: -4(3p) + p
    a. -11p b. -13p c. -16p d. -12 + p
18. Sam cannot read a part of this homework problem: -7y + 5(3 + __y). Sam knows the expression simplifies to 3y + 15. What number replaces the blank line in the homework problem?
    a. -4 b. 2 c. 4 d. 10
19. Which answer shows another way of writing the expression: 4(3b) – 2(3b + 1)
    a. 2b + 1 b. 2b – 2 c. 6b + 1 d. 6b – 2
20. Julius bought 3 games on sale. The original price of each game was d dollars. The expression, 3(d – 0.2d), shows the total amount Julius paid. Which expression is equivalent to this?
    a. 2.4d b. 2.8d c. 3d – 0.2 d. 3d – 0.6
21. What is the simplified form of the expression: 5y – 2y + 3(y)
    a. 0 b. 6y c. 10y d. 12y
22. Becka wrote the expression 3b -14b + 28b ÷ 7 + 2. Which expression shows where Becka should insert parentheses to make the expression equal to -3b + 2?
    a. 3b – 14b + (28b ÷ 7) + 2 b. (3b – 14b + 28b) ÷7 + 2 c. 3b – (14b + 28b) ÷7 + 2 d. (3b – 14b) + 28b÷(7+2)
23. What is the value of $q^3 + 3q^2 + 4$ for q = -2?
    a. -16 b. -14 c. 8 d. 10
24. What is the value of $-7y + y^3 - (2y)^2$ for y = 5?
    a. -40 b. -10 c. 40 d. 60
25. The expression $x^2 + 10x + 24$ represents the area of a rectangle, in square inches. What is the area of this rectangle when x=3?
    a. 60 sq. in. b. 63 sq. in. c. 81 sq. in. d. 86 sq. in.
26. The shaded area in the diagram shows the parking lot inside a park. The expression, $x^2 + 80x + 150 - (x^2 - 20x + 100)$, models the area of the park, in square yards, not including the parking lot. What is the area of the park when x = 50?
    a. 3,250 sq. yards
    b. 4,150 sq. yards
    c. 5,050 sq. yards
    d. 6,650 sq. yards

27. The height, in feet, of an object launched into the air after t seconds is modeled by the expression: $-16t^2 + 50t + 20$. What is the height of this object after 3 seconds?
    a. 26 feet b. 74 feet c. 266 feet d. 314 feet
28. What is the value of the expression $x^3 + 2x^2 - x + 5$ when $x = -3$?
    a. -1 b. -7 c. -13 d. -37
29. Jerry wrote the expression: $3x^3 + 2x^2 - 6x - 12$. What is the value of the expression when $x = 3$?
    a. 15 b. 63 c. 69 d. 93
30. A rectangular prism is removed from the center of a cube as shown. Which expression can be used to find the volume of the resulting shape?
    a. $9^3 - 3^2$ c. $9^3 - 3^2 \times 9$
    b. $9^3 - 3^3$ d. $9^3 - 9^2 \times 3$

Free Response:

31. What is the simplest form of the expression: $5x + 12 - 2(x + 7)$?
32. Is the number 5.323232…. rational or irrational? Justify your reasoning.
33. A carpenter has a board that is 6 ¾ feet long. She cuts the board into 3 equal pieces. What is the length, in feet, of each board?