**Algebra Mid-Term Review (2013-2014)**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

\_\_\_\_ 1. A computer manufacturing company inspects 350 LCD screens and finds that 14 have defects. What is the best estimate for the number of defective screens in their daily production of 2000 LCD screens?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 80 | c. | 160 |
| b. | 3 | d. | 66 |

\_\_\_\_ 2. Identify the set of numbers that best describes the following situation.

*the value of coins in a piggy bank*

|  |  |  |  |
| --- | --- | --- | --- |
| a. | rational numbers | c. | whole numbers |
| b. | integers | d. | irrational numbers |

\_\_\_\_ 3. Identify the constant term in the following expression: .

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 6 | c. |  |
| b. | 7 | d. |  |

\_\_\_\_ 4. Simplify .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 5. This week Sally withdrew $35 from her bank account and deposited $80 into her bank account. Overall, how much did she add to her bank account this week?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | $45 | c. | $55 |
| b. | $115 | d. | $35 |

\_\_\_\_ 6.  equals

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | d. |  |
| b. |  | e. | None correct |
| c. |  |

\_\_\_\_ 7. Simplify .

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 100 | c. | 283 |
| b. | 164 | d. | –4 |

\_\_\_\_ 8. Evaluate .

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 201 | c. | 64 |
| b. | 207 | d. | –135 |

\_\_\_\_ 9. A door is 6 feet wide and 8 feet tall. What is the area of the door in square inches?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 6912 square inches | c. | 6912 square feet |
| b. | 48 square feet | d. | 576 square inches |

\_\_\_\_ 10. Evaluate the expression for  and .



|  |  |  |  |
| --- | --- | --- | --- |
| a. | –37 | c. | 3 |
| b. | –82 | d. | –12 |

\_\_\_\_ 11. Simplify –.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 0 | c. | –9 |
| b. | –27 | d. | 27 |

\_\_\_\_ 12. Estimate  to the nearest integer. Use a calculator to check your answer.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 7 | c. | 22 |
| b. | 6 | d. | 1936 |

\_\_\_\_ 13. Simplify .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 14. Evaluate .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 15. Which equation demonstrates the Identity Property of Multiplication?

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 16. If a number cube labeled 1–6 is rolled, what is the probability that the roll will produce a number less than 5?

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 17. Simplify .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 18. If  and , then  equals

|  |  |  |  |
| --- | --- | --- | --- |
| a. | –3 | d. | 1 |
| b. | 3 | e. | None correct |
| c. | –1 |

\_\_\_\_ 19. Joe gets paid $9 per hour. Write the amount of money *d* he has after working for *h* hours.

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 20. Express the perimeter of the following rectangle in terms of *n*.



|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 21. Which ordered pair is located in the third quadrant of a coordinate plane?

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 22. On the evening news, viewers are invited to call in and vote for the candidate they think will win the election. What sampling method is used?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | voluntary | c. | convenience |
| b. | simple | d. | stratified |

\_\_\_\_ 23. Solve 

|  |  |  |  |
| --- | --- | --- | --- |
| a. | *z* = 72 | c. | *z* = –72 |
| b. | *z* = 2 | d. | *z* = –2 |

\_\_\_\_ 24. 0.41 of 32 is what number?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 13.12 | c. | 45.12 |
| b. | 78.05 | d. | 12.00 |

\_\_\_\_ 25. Nora buys a case of 75 tea bags for her family. They use 5 bags a day. Which function rule can she use to find the number of tea bags remaining on any given day?

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | d. |  |
| b. |  | e. | None correct |
| c. |  |

\_\_\_\_ 26. Solve .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 27. Solve for *p*: .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 28. Simplify .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 29. Find the ninth term of the sequence 3, 8, 13, 18, . . . .

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 43 | d. | 38 |
| b. | 53 | e. | None correct |
| c. | 48 |

\_\_\_\_ 30. Multiply . What is the product in scientific notation?

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 31. Find the greatest common factor of .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 32. Simplify .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 33. Simplify .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 34. The Anderson family is preparing for a family reunion. They think they will need 12 juice boxes for every 4 children who attend. How many juice boxes will they need if they are expecting 20 children?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 60 juice boxes | c. | 48 juice boxes |
| b. | 12 juice boxes | d. | 240 juice boxes |

\_\_\_\_ 35. Determine whether the events are independent or dependent.

Each player on the soccer team can choose a jersey from the team jersey set, and each jersey contains a different two-digit number from 10 to 99. Chris chooses 32, and then Pat chooses 77.

|  |  |  |  |
| --- | --- | --- | --- |
| a. | independent | b. | dependent |

\_\_\_\_ 36. 170% of 54 equals

|  |  |  |  |
| --- | --- | --- | --- |
| a. | 91.8 | d. | 3.15 |
| b. | 918 | e. | None correct |
| c. | 9.18 |

\_\_\_\_ 37. For what value of *x* is  undefined?

|  |  |  |  |
| --- | --- | --- | --- |
| a. | –4 | c. | 2 |
| b. | –3 | d. | –8 |

\_\_\_\_ 38. Simplify .

|  |  |  |  |
| --- | --- | --- | --- |
| a. | –70 | c. | –114,333 |
| b. | –700 | d. | undefined |

\_\_\_\_ 39. What is the equation of the line?



|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

\_\_\_\_ 40. Find the slope of the line that contains  and .

|  |  |  |  |
| --- | --- | --- | --- |
| a. |  | c. |  |
| b. |  | d. |  |

**Numeric Response**

**Solve.**

41. Simplify .

42. Evaluate the expression for the given values of the variables.

 for *x* = 3, *y* = –5, and *z* = –2

43. What is the value of *n* in ?

44. What is the value of *x* when ?

45. What is the *x*-intercept on the graph?



46. The area of a square rug is 144 square feet. What is the side length, in feet, of the rug?

**Problem**

47. Order the numbers below from least to greatest.

, 0.79, , –0.7

48. Simplify . Justify each step.

49. Eli has 9 equally sized slips of paper. He writes a number on each, so that the slips of paper are labeled 1 through 9. He places all 9 slips in a hat.

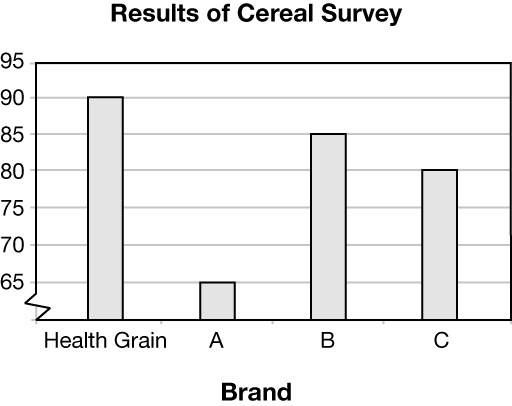
a. What is the sample space when randomly choosing a slip of paper from the hat?

b. What is the probability of randomly drawing a number greater than 7?

c. Eli is trying to draw a number greater than 7. He draws a 4 and puts it back into the hat. He then draws a 2 and puts it back in the hat. What is the probability that he draws a number greater than 7 on his next try? Why?

d. Is there a greater chance of drawing an even number or drawing a number less than 5? Justify your answer.

50. In a survey, participants were asked to choose their favorite of 4 cereals. Health Grain Cereal Company made the graph below to display the results of the survey.



a. Explain why the graph may be misleading.

b. What conclusion might be made from the graph? Why might Health Grain have created this graph?

c. Make a graph of the survey data that is not misleading.

**Algebra Mid-Term Review (2013-2014)**

**Answer Section**

**MULTIPLE CHOICE**

1. ANS: A PTS: 1 REF: Investigation 1: Determining the Probability of an Event

NAT: NCTM NO.1a TOP: Benchmark Test 3

MSC: Alg1\_S01\_00049

2. ANS: A PTS: 1 REF: Lesson 1: Classifying Real Numbers

NAT: NCTM NO.1b TOP: Benchmark Test 1

MSC: Alg1\_S01\_00050

3. ANS: A PTS: 1 REF: Lesson 2: Understanding Variables and Expressions

NAT: NCTM A.1e TOP: Benchmark Test 1 MSC: Alg1\_S01\_00051

4. ANS: A PTS: 1

REF: Lesson 3: Simplifying Expressions Using the Product Rule of Exponents

NAT: NCTM A.2a TOP: Benchmark Test 1 MSC: Alg1\_S01\_00052

5. ANS: A PTS: 1

REF: Lesson 5: Finding Absolute Value and Adding Real Numbers

NAT: NCTM NO.2b TOP: Benchmark Test 1

MSC: Alg1\_S01\_00054

6. ANS: A PTS: 1 REF: Lesson 6: Subtracting Real Numbers

NAT: NCTM NO.3a TOP: End-of-Course Exam

MSC: Alg1\_S01\_00055

7. ANS: A PTS: 1

REF: Lesson 7: Simplifying and Comparing Expressions with Symbols of Inclusion

NAT: NCTM NO.3a TOP: Benchmark Test 1

MSC: Alg1\_S01\_00058

8. ANS: A PTS: 1

REF: Lesson 7: Simplifying and Comparing Expressions with Symbols of Inclusion

NAT: NCTM NO.3a TOP: Benchmark Test 2

MSC: Alg1\_S01\_00059

9. ANS: A PTS: 1 REF: Lesson 8: Using Unit Analysis to Convert Measures

NAT: NCTM M.2b TOP: Benchmark Test 1

MSC: Alg1\_S01\_00060

10. ANS: A PTS: 1

REF: Lesson 9: Evaluating and Comparing Algebraic Expressions

NAT: NCTM NO.3a TOP: Benchmark Test 1

MSC: Alg1\_S01\_00061

11. ANS: B PTS: 1 REF: Lesson 11: Multiplying and Dividing Real Numbers

NAT: NCTM NO.2a MSC: Alg1\_S02\_00003

12. ANS: A PTS: 1 REF: Lesson 13: Calculating and Comparing Square Roots

NAT: NCTM NO.2a MSC: Alg1\_S02\_00012

13. ANS: D PTS: 1 REF: Lesson 18: Combining Like Terms

NAT: NCTM A.2a MSC: Alg1\_S02\_00034

14. ANS: A PTS: 1 REF: Lesson 11: Multiplying and Dividing Real Numbers

NAT: NCTM A.2b TOP: Benchmark Test 1 MSC: Alg1\_S02\_00050

15. ANS: A PTS: 1

REF: Lesson 12: Using the Properties of Real Numbers to Simplify Expressions

NAT: NCTM NO.2a TOP: Benchmark Test 3

MSC: Alg1\_S02\_00052

16. ANS: A PTS: 1

REF: Lesson 14: Determining the Theoretical Probability of an Event

NAT: NCTM DAP.4a TOP: Benchmark Test 2

MSC: Alg1\_S02\_00053

17. ANS: A PTS: 1

REF: Lesson 15: Using the Distributive Property to Simplify Expressions

NAT: NCTM A.2a TOP: Benchmark Test 1 MSC: Alg1\_S02\_00054

18. ANS: A PTS: 1

REF: Lesson 16: Simplifying and Evaluating Variable Expressions

NAT: NCTM NO.3a TOP: End-of-Course Exam

MSC: Alg1\_S02\_00055

19. ANS: A PTS: 1

REF: Lesson 17: Translating Between Words and Algebraic Expressions

NAT: NCTM A.2b TOP: Benchmark Test 1 MSC: Alg1\_S02\_00061

20. ANS: A PTS: 1 REF: Lesson 18: Combining Like Terms

NAT: NCTM G.4d TOP: Benchmark Test 1 MSC: Alg1\_S02\_00062

21. ANS: A PTS: 1 REF: Lesson 20: Graphing on a Coordinate Plane

NAT: NCTM G.2a TOP: Benchmark Test 1 MSC: Alg1\_S02\_00065

22. ANS: A PTS: 1

REF: Investigation 3: Analyzing the Effects of Bias in Sampling, Surveys, and Bar Graphs

NAT: NCTM DAP.1b TOP: Benchmark Test 3

MSC: Alg1\_S03\_00001

23. ANS: A PTS: 1

REF: Lesson 21: Solving One-Step Equations by Multiplying or Dividing

NAT: NCTM A.2b TOP: Benchmark Test 2 MSC: Alg1\_S03\_00002

24. ANS: A PTS: 1 REF: Lesson 24: Solving Decimal Equations

NAT: NCTM NO.2a TOP: Benchmark Test 2

MSC: Alg1\_S03\_00004

25. ANS: A PTS: 1

REF: Lesson 25: Differentiating Between Relations and Functions

NAT: NCTM A.2b TOP: End-of-Course Exam MSC: Alg1\_S03\_00005

26. ANS: A PTS: 1 REF: Lesson 26: Solving Multi-Step Equations

NAT: NCTM A.2b TOP: Benchmark Test 3 MSC: Alg1\_S03\_00008

27. ANS: A PTS: 1 REF: Lesson 29: Solving Literal Equations

NAT: NCTM A.2b TOP: Benchmark Test 2 MSC: Alg1\_S03\_00011

28. ANS: A PTS: 1

REF: Lesson 32: Simplifying and Evaluating Expressions with Integer and Zero Exponents

NAT: NCTM A.2a TOP: Benchmark Test 2 MSC: Alg1\_S04\_00004

29. ANS: A PTS: 1

REF: Lesson 34: Recognizing and Extending Arithmetic Sequences

NAT: NCTM A.2a TOP: End-of-Course Exam MSC: Alg1\_S04\_00007

30. ANS: A PTS: 1 REF: Lesson 37: Using Scientific Notation

NAT: NCTM NO.1a TOP: Benchmark Test 2

MSC: Alg1\_S04\_00009

31. ANS: A PTS: 1 REF: Lesson 38: Simplifying Expressions Using the GCF

NAT: NCTM A.2a TOP: Benchmark Test 2 MSC: Alg1\_S04\_00011

32. ANS: A PTS: 1

REF: Lesson 39: Using the Distributive Property to Simplify Rational Expressions

NAT: NCTM A.2a TOP: Benchmark Test 3 MSC: Alg1\_S04\_00012

33. ANS: A PTS: 1

REF: Lesson 40: Simplifying and Evaluating Expressions Using the Power Rule for Exponents

NAT: NCTM A.2a TOP: Benchmark Test 2 MSC: Alg1\_S04\_00013

34. ANS: A PTS: 1 REF: Lesson 31: Using Rates, Ratios, and Proportions

NAT: NCTM NO.3a MSC: Alg1\_S04\_00018

35. ANS: B PTS: 1

REF: Lesson 33: Finding the Probability of Independent and Dependent Events

NAT: NCTM DAP.4d MSC: Alg1\_S04\_00022

36. ANS: A PTS: 1 REF: Lesson 42: Solving Percent Problems

NAT: NCTM NO.2a TOP: End-of-Course Exam

MSC: Alg1\_S05\_00002

37. ANS: A PTS: 1 REF: Lesson 43: Simplifying Rational Expressions

NAT: NCTM A.2b TOP: Benchmark Test 3 MSC: Alg1\_S05\_00003

38. ANS: A PTS: 1

REF: Lesson 46: Simplifying Expressions with Square Roots and Higher-Order Roots

NAT: NCTM NO.2a TOP: Benchmark Test 3

MSC: Alg1\_S05\_00005

39. ANS: A PTS: 1 REF: Lesson 49: Writing Equations in Slope-Intercept Form

NAT: NCTM A.2a TOP: Benchmark Test 3 MSC: Alg1\_S05\_00009

40. ANS: B PTS: 1 REF: Lesson 44: Finding Slope Using the Slope Formula

NAT: NCTM A.4 MSC: Alg1\_S05\_00024

**NUMERIC RESPONSE**

41. ANS: 39

PTS: 1 REF: Lesson 4: Using Order of Operations

NAT: NCTM NO.3a TOP: Benchmark Test 1

MSC: Alg1\_S01\_00064

42. ANS: –180

PTS: 1 REF: Lesson 16: Simplifying and Evaluating Variable Expressions

NAT: NCTM A.1f TOP: Benchmark Test 1 MSC: Alg1\_S02\_00083

43. ANS: 64

PTS: 1 REF: Lesson 19: Solving One-Step Equations by Adding or Subtracting

NAT: NCTM A.2b TOP: Benchmark Test 1 MSC: Alg1\_S02\_00084

44. ANS: 1

PTS: 1 REF: Lesson 28: Solving Equations with Variables on Both Sides

NAT: NCTM A.2b TOP: Benchmark Test 2 MSC: Alg1\_S03\_00066

45. ANS: –5

PTS: 1 REF: Lesson 35: Locating and Using Intercepts

NAT: NCTM G.2a TOP: Benchmark Test 2 MSC: Alg1\_S04\_00069

46. ANS: 12

PTS: 1 REF: Lesson 13: Calculating and Comparing Square Roots

NAT: NCTM M.2b TOP: Cumulative Test 5

MSC: Alg1\_S02\_00076

**PROBLEM**

47. ANS:

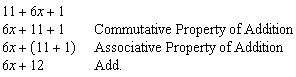
–0.7, , , 0.79

PTS: 1 REF: Lesson 10: Adding and Subtracting Real Numbers

NAT: NCTM NO.1b TOP: Cumulative Test 2

MSC: Alg1\_S01\_00142

48. ANS:



PTS: 1 REF: Lesson 12: Using the Properties of Real Numbers to Simplify Expressions

NAT: NCTM A.2a TOP: Benchmark Test 1 MSC: Alg1\_S02\_00090

49. ANS:

a. 

b. ; 22%; 

c. ; 22%; ; The probability of drawing a number greater than 7 remains the same regardless of the outcomes of previous draws. There are still 2 favorable outcomes out of 9 possible outcomes.

d. Sample: There is an equal chance of drawing either. The probabilities are  and 

PTS: 1 REF: Lesson 14: Determining the Theoretical Probability of an Event

NAT: NCTM DAP.4a TOP: Benchmark Test 1

MSC: Alg1\_S02\_00107

50. ANS:

a. Sample: The scale does not start at zero, so the heights of the bars vary greatly, even though the data values are very close to each other.

b. Sample: The graph seems to show that people prefer Health Grain to other brands.

c.

|  |
| --- |
| **Results of Cereal Survey** |
|  |

PTS: 1 REF: Lesson 27: Identifying Misleading Representations of Data

NAT: NCTM DAP.1a TOP: Benchmark Test 2

MSC: Alg1\_S03\_00095