

IEC Southern Colorado Math Review

The following sheets include key concepts that will be seen on the math diagnostic. You will not be permitted to use a calculator on the math diagnostic, so we recommend not using one on these practice sheets either. All the answers are at the end of this packet so that you can check your work.

- Questions 1 through 33 – Whole Number Concepts:
 - Recognize the place value for each place.
 - Name numbers correctly with words.
 - Write numbers correctly when given the word names.
 - Add, subtract, multiply, and divide.
 - Round numbers to any given place.
 - Estimate sums, differences, products, and quotients.
 - Solve application problems using whole numbers.
 - Correctly apply the order of operations.
 - Express numbers using exponents.
 - Distinguish between prime and composite numbers.
 - Give the prime factorization of numbers.
 - Find the lowest common multiple of two numbers.
- Questions 34 through 45 – Fractions:
 - Determine what fraction of a set of assorted objects are shaded.
 - Convert fractions to equivalent fractions.
 - Reduce fractions.
 - Multiply and divide fractions and simplify.
 - Add and subtract fractions and simplify.
 - Find reciprocals.
- Questions 46 through 66 – Mixed Numbers:
 - Change a mixed number to an improper fraction.
 - Change an improper fraction to a mixed number.
 - Multiply and divide and simplify.
 - Add and subtract and simplify.
 - Solve application problems involving fractions and mixed numbers.

For the math diagnostic, you will also need to be able to read a tape measure.

Math Practice**Problem**

1. What place value does 3 have in 4,235,100?
2. Which digit is in the thousands place in 4,968,123?
3. Write correctly in words:
a. 305 b. 10,660
4. $46 + 729 + 1025 + 47 =$
5. $96 + 321 + 21 =$
6. $423 - 69 =$
7. $982 - 793 =$
8. $145 \times 36 =$
9. $21 \cdot 14 =$
10. $396 \div 23 =$
11. $5422 \div 17 =$
12. Round 799 to the nearest ten.
13. Round 92,449 to the nearest thousand.
14. Round 4,868 to the nearest hundred.
15. Round 123 to the nearest hundred.
16. Estimate the sum of $38 + 99 + 21 + 14$ by rounding to the nearest ten.
17. Estimate the difference of $621 - 267$ by rounding to the nearest hundred.
18. Estimate the quotient of $48 \div 8$ by rounding to the nearest ten.
19. Estimate the product of 67×23 by rounding to the nearest ten.
20. Thirty identical chairs cost \$1680. What is the cost of one chair?

21. Jose read 39 books in 1994, 27 books in 1995, and 35 books in 1996. How many books did he read over the 3 years?
22. Bart gives the cashier three \$50 bills to pay for a purchase of \$123. How much change should he get back?
23. What is the number of square yards in a field that measures 30yds. by 41yds.?
24. Rewrite using exponents:
a. 9×9 b. $5 \times 5 \times 5$
25. Rewrite without exponents:
a. 4^5 b. 7^3
26. $12 \div 4 \times 3 =$
27. $3 \times 3 \div 3$
28. $9 - 6 \div 2 =$
29. $14 + 7 \times 2 =$
30. $3 \times (6 + 2) - 3 + 4 \div 2 =$
31. $5 \times \{3 \times [9 - (4 + 1)]\} + 20 \div 4 \times 2 =$
32. Find the prime factorization of each number:
a. 12 b. 100
c. 81 d. 105
33. Find the least common multiple of each pair of numbers:
a. 6 and 12 b. 6 and 7 c. 12 and 18
d. 15 and 30 e. 14 and 49

34. What fraction of the rectangles are shaded?



35. What fraction of the objects are geometric shapes?



36. What fraction of the objects are numbers?



37. Which fraction is equivalent to $\frac{1}{3}$?

a. $\frac{2}{4}$ b. $\frac{2}{6}$ c. $\frac{3}{1}$ d. $\frac{3}{6}$

38. Which fraction is equivalent to $\frac{2}{7}$?

a. $\frac{7}{2}$ b. $\frac{1}{6}$ c. $\frac{3}{8}$ d. $\frac{6}{21}$

39. Reduce each fraction to lowest terms:

a. $\frac{6}{9}$ b. $\frac{12}{20}$ c. $\frac{3}{12}$

40. Multiply each pair of fractions and simplify (reduce) the result:

a. $\frac{6}{4} \times \frac{2}{3}$ b. $\frac{2}{3} \times \frac{1}{4}$

c. $\frac{1}{9} \times \frac{2}{7}$ d. $\frac{2}{7} \times \frac{14}{16}$

41. Find the reciprocal of each number:

a. $\frac{2}{3}$ b. $\frac{8}{3}$ c. 6

42. Divide and simplify the results:

a. $\frac{1}{3} \div \frac{2}{7}$ b. $\frac{2}{5} \div \frac{5}{6}$ c. $\frac{9}{8} \div \frac{3}{2}$

43. Find the lowest common denominator (LCD) of each set of fractions:

a. $\frac{3}{4}, \frac{1}{3}$ b. $\frac{1}{5}, \frac{2}{15}$ c. $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$

d. $\frac{1}{5}, \frac{1}{6}$ e. $\frac{7}{20}, \frac{1}{25}$ f. $\frac{5}{12}, \frac{7}{16}$

44. Add and simplify:

a. $\frac{1}{4} + \frac{2}{5}$ b. $\frac{1}{5} + \frac{7}{15}$ c. $\frac{5}{12} + \frac{7}{16}$

45. Subtract and simplify:

a. $\frac{9}{16} - \frac{1}{4}$ b. $\frac{1}{2} - \frac{3}{8}$ c. $\frac{7}{9} - \frac{1}{12}$ d. $\frac{7}{8} - \frac{1}{3}$

46. Change to improper fractions:

a. $2\frac{1}{5}$ b. $3\frac{3}{8}$ c. $7\frac{1}{4}$

47. Change to mixed numbers:

a. $\frac{25}{3}$ b. $\frac{12}{5}$ c. $\frac{37}{7}$ d. $\frac{49}{3}$

48. Multiply and simplify:

a. $1\frac{1}{5} \times 2\frac{1}{3}$ b. $2\frac{1}{5} \times 3\frac{1}{3}$ c. $1\frac{1}{3} \times 1\frac{1}{2}$

49. Divide and simplify:

a. $6\frac{3}{4} \div 1\frac{1}{2}$ b. $2\frac{5}{8} \div 1\frac{1}{6}$ c. $4 \div 1\frac{1}{2}$

50. Add and simplify:

a. $3\frac{1}{4} + 2\frac{3}{8}$ b. $1\frac{1}{5} + 2\frac{1}{7}$ c. $3\frac{9}{16} + 5\frac{3}{4}$

51. Subtract and simplify:

a. $3\frac{1}{2} - 1\frac{1}{3}$ b. $5\frac{1}{16} - 2\frac{3}{4}$ c. $9\frac{1}{4} - 3\frac{5}{8}$

52. Solve each application problem:

a. A recipe calls for $5\frac{1}{2}$ cups of flour. How many cups of flour are needed for $\frac{1}{2}$ of the recipe?

b. A bamboo plant grew $\frac{1}{2}$ inch Monday, $\frac{2}{3}$ inch Tuesday, and $\frac{3}{4}$ inch Wednesday. How many inches did the bamboo grow in the 3 days?

c. A share of stock XYZ went from $\$40\frac{7}{8}$ to $\$42\frac{3}{8}$. What was the dollar gain for the stock XYZ?

d. How many cubic yards of cement must be ordered to pour a sidewalk $30\frac{1}{2}$ yd by $1\frac{1}{4}$ yd by $\frac{1}{9}$ yd?

53. What place value does 3 have in 0.693?

54. What digit is in the ten-thousandths place in 0.28976?

55. Write the word name for each decimal number:

a. 10.123 b. 2.101 c. 0.93

56. Write the decimal number for each word name:

- a. four thousand and three hundredths
- b. seventy-eight hundred-thousandths
- c. one hundred two and two tenths

57. Round each number to the indicated place:

- a. 9.0673 to the nearest hundredth
- b. 102.1029 to the nearest tenth
- c. 39.9875 to the nearest thousandth
- d. 10.1022 to the nearest hundredth

Name: _____

ID: A

58. $3.6 + 0.201 + 0.05 =$

59. $39.78 - 23.99 =$

60. $23.05 \times 11.62 =$

61. $6.350 \div 3 =$

62. $9.773 \div 0.12 =$

63. If two dresses that are the same price cost \$213.68 total, how much does one dress cost?

64. If 4 shirts cost \$84.50, 3 coats cost \$213.68, and 4 pairs of slacks cost \$98.99, what is the total cost for all the clothing?

65. If a steel beam 58.5cm long is to be cut into pieces that are 6.5cm in length, how many pieces will there be?

66. If each cookie at a bake sale costs \$0.55, how much does a dozen cost?

**Math Practice
Answer Section****PROBLEM**

1. ANS:
ten thousands

4,235,100
4 = millions
2 = hundred thousands
3 = ten thousands
5 = thousands
1 = hundreds
0 = tens
0 = ones

PTS: 1

2. ANS:
8

PTS: 1

3. ANS:
a. three hundred five b. ten thousand, six hundred sixty

PTS: 1

4. ANS:
1,847

PTS: 1

5. ANS:
438

PTS: 1

6. ANS:
354

PTS: 1

7. ANS:
189

PTS: 1

8. ANS:
5,220

$$\begin{array}{r} 145 \\ \times 36 \\ \hline 870 \\ 435 \\ \hline 5,220 \end{array}$$

PTS: 1

9. ANS:
294 (a dot also means multiply)

PTS: 1

10. ANS:

$$\begin{array}{r} 17, R5 \\ 23 \overline{) 396} \\ \underline{-23} \\ = 166 \\ \underline{-161} \\ = 5 \end{array}$$

PTS: 1

11. ANS:
318 R16

PTS: 1

12. ANS:
800

PTS: 1

13. ANS:
92,000

PTS: 1

14. ANS:
4,900

PTS: 1

15. ANS:
100

PTS: 1

16. ANS:
 $40 + 100 + 20 + 10 = 170$

PTS: 1

17. ANS:
 $600 - 300 = 300$

PTS: 1

18. ANS:
 $50 \div 10 = 5$

PTS: 1

19. ANS:
 $70 \times 20 = 1400$

PTS: 1

20. ANS:
 $\$1680 \div 30 = \56

PTS: 1

21. ANS:
 $39 + 27 + 35 = 101$

PTS: 1

22. ANS:
 $\$50 \times 3 = \150
 $\$150 - \$123 = \$27$

PTS: 1

23. ANS:
 $30yd \times 41yd = 1230yd^2$

PTS: 1

24. ANS:
a. 9^2 b. 5^3

PTS: 1

25. ANS:
a. $4 \times 4 \times 4 \times 4 \times 4$ b. $7 \times 7 \times 7$

PTS: 1

26. ANS:
 $12 \div 4 \times 3$
 3×3
9

PTS: 1

27. ANS:

$$3 \times 3 \div 3$$

$$9 \div 3$$

$$3$$

PTS: 1

28. ANS:

$$9 - 6 \div 2$$

$$9 - 3$$

$$6$$

PTS: 1

29. ANS:

$$14 + 7 \times 2$$

$$14 + 14$$

$$28$$

PTS: 1

30. ANS:

$$3 \times (6 + 2) - 3 + 4 \div 2$$

$$3 \times 8 - 3 + 4 \div 2$$

$$24 - 3 + 4 \div 2$$

$$24 - 3 + 2$$

$$21 + 2$$

$$23$$

PTS: 1

31. ANS:

$$5 \times \{3 \times [9 - (4 + 1)]\} + 20 \div 4 \times 2$$

$$5 \times \{3 \times [9 - 5]\} + 20 \div 4 \times 2$$

$$5 \times \{3 \times 4\} + 20 \div 4 \times 2$$

$$5 \times 12 + 20 \div 4 \times 2$$

$$60 + 5 \times 2$$

$$60 + 10$$

$$70$$

PTS: 1

32. ANS:

$$\begin{array}{ll} \text{a. } 12 = 2 \times 2 \times 3 = 2^2 \times 3 & \text{b. } 100 = 2 \times 2 \times 5 \times 5 = 2^2 \times 5^2 \\ \text{c. } 81 = 3 \times 3 \times 3 \times 3 = 3^4 & \text{d. } 100 = 3 \times 5 \times 7 \end{array}$$

PTS: 1

33. ANS:

$$\begin{array}{lll} \text{a. } 12 & \text{b. } 42 & \text{c. } 36 \\ \text{d. } 30 & \text{e. } 98 & \end{array}$$

PTS: 1

34. ANS:

$$\frac{2}{5}$$

PTS: 1

35. ANS:

$$\frac{3}{6}$$

PTS: 1

36. ANS:

$$\frac{4}{7}$$

PTS: 1

37. ANS:

$$\frac{1}{3} \times \frac{2}{2} = \frac{2}{6}$$

PTS: 1

38. ANS:

$$\frac{2}{7} \times \frac{3}{3} = \frac{6}{21}$$

PTS: 1

39. ANS:

$$\begin{array}{lll} \text{a. } \frac{6}{9} = \frac{2 \times 3}{3 \times 3} = \frac{2}{3} & \text{b. } \frac{12}{20} = \frac{3 \times 4}{5 \times 4} = \frac{3}{5} & \text{c. } \frac{3}{12} = \frac{1 \times 3}{4 \times 3} = \frac{1}{4} \end{array}$$

PTS: 1

40. ANS:

$$\begin{array}{ll} \text{a. } \frac{6}{4} \times \frac{2}{3} = \frac{12}{12} = 1 & \text{b. } \frac{2}{3} \times \frac{1}{4} = \frac{2}{12} = \frac{1}{6} \\ \text{c. } \frac{1}{9} \times \frac{2}{7} & \text{d. } \frac{2}{7} \times \frac{14}{16} \end{array}$$

PTS: 1

41. ANS:

$$\text{a. } \frac{3}{2} \quad \text{b. } \frac{3}{8} \quad \text{c. } \frac{1}{6}$$

PTS: 1

42. ANS:

$$\text{a. } \frac{1}{3} \div \frac{2}{7} = \frac{1}{3} \times \frac{7}{2} = \frac{7}{6} \quad \text{b. } \frac{2}{5} \div \frac{5}{6} = \frac{2}{5} \div \frac{6}{5} = \frac{12}{25} \quad \text{c. } \frac{9}{8} \div \frac{3}{2} = \frac{9}{8} \times \frac{2}{3} = \frac{18}{24} = \frac{3}{4}$$

PTS: 1

43. ANS:

$$\text{a. } 12 \quad \text{b. } 15 \quad \text{c. } 12 \\ \text{d. } 30 \quad \text{e. } 100 \quad \text{f. } 48$$

PTS: 1

44. ANS:

$$\text{a. LCD is } 20 \quad \frac{5}{20} + \frac{8}{20} = \frac{13}{20} \\ \text{b. LCD is } 15 \quad \frac{3}{15} + \frac{7}{15} = \frac{10}{15} = \frac{2}{3} \\ \text{c. LCD is } 48 \quad \frac{20}{48} + \frac{21}{48} = \frac{41}{48}$$

PTS: 1

45. ANS:

$$\text{a. LCD is } 16 \quad \frac{9}{16} - \frac{4}{16} = \frac{5}{16} \\ \text{b. LCD is } 8 \quad \frac{4}{8} - \frac{3}{8} = \frac{1}{8} \\ \text{c. LCD is } 36 \quad \frac{28}{36} - \frac{3}{36} = \frac{25}{36} \\ \text{d. LCD is } 24 \quad \frac{21}{24} - \frac{8}{24} = \frac{13}{24}$$

PTS: 1

46. ANS:

$$\text{a. } 2\frac{1}{5} = \frac{5 \times 2 + 1}{5} = \frac{11}{5} \quad \text{b. } \frac{27}{8} \quad \text{c. } \frac{29}{4}$$

PTS: 1

47. ANS:

$$\text{a. } \frac{25}{3} = 25 \div 3 = 8\frac{1}{3} \quad \text{b. } 2\frac{2}{5} \quad \text{c. } 5\frac{2}{7} \quad \text{d. } 16\frac{1}{3}$$

PTS: 1

48. ANS:

$$\text{a. } \frac{6}{5} \times \frac{7}{3} = \frac{42}{15} = 2\frac{4}{5} \quad \text{b. } \frac{11}{5} \times \frac{10}{3} = \frac{110}{15} = 7\frac{1}{3} \quad \text{c. } \frac{4}{3} \times \frac{3}{2} = \frac{12}{6} = 2$$

PTS: 1

49. ANS:

$$\text{a. } 6\frac{3}{4} \div 1\frac{1}{2} = \frac{27}{4} \div \frac{3}{2} = \frac{27}{4} \times \frac{2}{3} = \frac{54}{12} = 4\frac{1}{2}$$

$$\text{b. } 2\frac{5}{8} \div 1\frac{1}{6} = \frac{21}{8} \div \frac{7}{6} = \frac{21}{8} \times \frac{6}{7} = \frac{126}{56} = 2\frac{1}{4}$$

$$\text{c. } 4 \div 1\frac{1}{2} = \frac{4}{1} \div \frac{3}{2} = \frac{4}{1} \times \frac{2}{3} = \frac{8}{3} = 2\frac{2}{3}$$

PTS: 1

50. ANS:

$$\text{a. } 3\frac{1}{4} = 3\frac{2}{8} \quad \text{b. } 3\frac{12}{35} \quad \text{c. } 8\frac{21}{16} = 9\frac{5}{16}$$

$$+ 2\frac{3}{8} = 2\frac{3}{8}$$

$$= 5\frac{5}{8}$$

PTS: 1

51. ANS:

$$\text{a. } 3\frac{1}{2} = 3\frac{3}{6} \quad \text{b. } 2\frac{5}{16} \quad \text{c. } 5\frac{5}{8}$$

$$- 1\frac{1}{3} = 1\frac{2}{6}$$

$$= 2\frac{1}{6}$$

PTS: 1

52. ANS:

$$\text{a. } 5\frac{1}{2} \text{ cups} \div 2 = \frac{11}{2} \text{ cups} \times \frac{1}{2} = \frac{11}{4} \text{ cups} = 2\frac{3}{4} \text{ cups}$$

$$\text{b. } \frac{1}{2} \text{ in} + \frac{2}{3} \text{ in} + \frac{3}{4} \text{ in} = 1\frac{11}{12} \text{ in}$$

$$\text{c. } \$42\frac{3}{8} - \$40\frac{7}{8} = \$1\frac{4}{8} = \$1\frac{1}{2}$$

$$\text{d. } 3\frac{1}{2} \text{ yd} \times 1\frac{1}{4} \text{ yd} \times \frac{1}{9} \text{ yd} = 4\frac{17}{72} \text{ yd}^3$$

PTS: 1

53. ANS:

thousandths 6=tenths, 9=hundredths, 3=thousandths

PTS: 1

54. ANS:

7

PTS: 1

55. ANS:
a. ten and one hundred twenty-three thousandths
b. two and one hundred one thousandths
c. ninety-three hundredths

PTS: 1

56. ANS:
a. 4000.03 b. 0.00078 c. 102.2

PTS: 1

57. ANS:
a. 9.07 b. 102.1 c. 39.988 d. 10.10

PTS: 1

58. ANS:
3.6
0.201
+ 0.05
= 3.851

PTS: 1

59. ANS:
15.79

PTS: 1

60. ANS:
267.8410

PTS: 1

61. ANS:
2.116

PTS: 1

62. ANS:
81.4416

PTS: 1

63. ANS:
 $\$93.98 \div 2 = \46.99

PTS: 1

64. ANS:
 $\$84.50 + \$213.68 + \$98.99 = \397.17

PTS: 1

65. ANS:
 $58.5cm \div 6.5cm = 9$
9 pieces

PTS: 1

66. ANS:
 $\$0.55 \times 12 = \6.60

PTS: 1