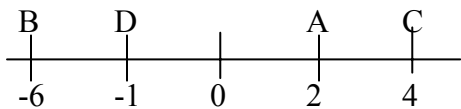


REVIEW PROBLEMS FOR ELEMENTARY ALGEBRA ASSESSMENT TEST-Rev 1

1.  $1203 - 984 =$

2.  $3808 \div 68 =$

3.



What is the distance from B to A?  
(i.e., how many units) from D to C?  
from B to D?  
from A to C?

4.  $\left(\frac{2}{5} - \frac{3}{2}\right) \div \left(\frac{1}{20} + \frac{1}{5}\right) =$

5. What is the prime factorization of 120?

6. a.  $|7| =$

b.  $|-7| =$

c.  $-|7| =$

d.  $-|-7| =$

7.  $2\frac{3}{4} + 5\frac{4}{5} =$

8. For all  $x$  such that  $x \neq 0$ ,  $\frac{2}{x} + \frac{3}{x} =$

9. For all  $x$  and  $y$  such that  $x \neq 0$  and  $y \neq 0$ ,  $\frac{3}{x} + \frac{5}{y} =$

10.  $\frac{r}{s} - \frac{x}{y} =$

11. If  $\frac{2}{x} = \frac{11}{5}$ , Then  $x =$

12. If  $\frac{9}{x-2} = 3$ , then  $x =$

13. If  $x = 2$ , evaluate:  $\frac{4x - 2}{3x}$

14. Write  $\frac{12m^2 - 9}{3}$  in lowest terms.

15. Write  $\frac{12m^2 - 7}{3}$  in lowest terms.

16.

a.  $2^3 =$

b.  $3^4 =$

c.  $(-2)^3 =$

d.  $(-2)^4 =$

e.  $(-2)^5 =$

f.  $(-2)^6 =$

17.

1.  $4(x + 2) = 4x + 8$

2.  $x + (y + z) = (x + y) + z$

3.  $A + 0 = A$

4.  $3 \cdot \frac{1}{3} = 1$

5.  $5 + -5 = 0$

6.  $5 \cdot (2 \cdot 4) = (5 \cdot 2) \cdot 4$

7.  $Y \cdot 1 = Y$

a. Associative for Addition

b. Associative for Multiplication

c. Additive Identity

d. Multiplicative Identity

e. Distributive

f. Additive Inverse

g. Multiplicative Inverse

18.  $\frac{5(-2) - 8(-1)}{3(-4) + 2(-4)} =$

19.  $4 + (-3)(-5) - 2(4) =$

20. Find the numerical value of the expression  $2x^2 + 6xy + 3y$  if  $x = 2$  and  $y = -3$ .

21. Solve the equation:  $6x + 2 = 4x - 10$

22. Solve the equation:  $4(2 + x) + 5 = 2(3x - 4)$

23. Solve the equation:  $\frac{x}{6} - \frac{3x}{2} = 4$

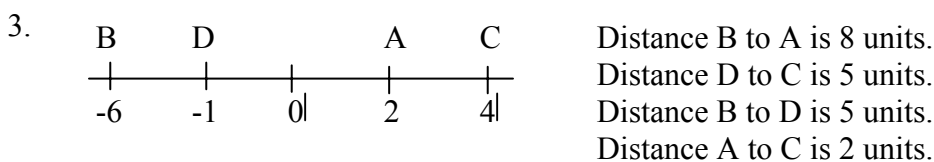
24. In a study of the attendance at the movies in a given week for a certain group of people it turned out that  $x$  people saw exactly two movies that week,  $y$  people saw exactly one movie that week and  $z$  people didn't see any movies. Write a formula showing the total number for movies ( $M$ ) seen that week.
25. A person took 5 tests in a class and received grades of 72, 83, 72, 94, and 76. What is the average grade?
26. If the average of two numbers is  $-15$  and one number is 9, what is the other number?
27. A plane ticket costs  $b$  dollars for an adult and  $d$  dollars for a child. Express the total cost ( $C$ ) for 3 adults and 2 children.
28. Mary is  $n$  years old. How old will she be in 8 years?
29. Yesterday Walt bought  $x$  apples. Today he bought 7 apples. How many apples did he buy all together?
30. A person is eating a meal which has 5 grams of protein, 20 grams of carbohydrates and 7 grams of fat. Fat is what fractional part of the whole meal?
31. Subtract the second number from the first:
- a. 5, 3
  - b. 7, -2
  - c. 6, -7
  - d. -4, 3
32. Which of the following represents an integer?
- a.  $\sqrt{5}$
  - b. 7
  - c. -3
  - d.  $\frac{2}{5}$
  - e.  $4^2$
33. Solve the proportion:  $\frac{x}{5} = \frac{20}{3}$
34. Solve the proportion:  $\frac{2x-1}{3} = \frac{x+2}{4}$

35. Solve the inequality:  $2x + 3 < 10$
36. Solve the inequality:  $-\frac{4}{5}x \geq 20$
37. Factor Completely:  $x^2 + 15x + 50$
38. Factor completely:  $6x + 10$
39. Simplify:  $\sqrt{\frac{25}{16}} =$
40. For all  $x$  and  $y$ ,  $\frac{1}{4}[5x - 7y - (x + y)] =$
41. A square is 8 units on a side. What is the area of the square?
42. A rectangle has length of 6 units and width of 5 units. What is the area of the rectangle?
43. A triangle has a base of 10 units and height of 3 units. What is the area of the triangle?
44.  $6^2 =$
45.  $(x + 2)^2 =$
46.  $8.8 \times 10^4 = ?$
47.  $2.5 \times 10^{-3} = ?$
48.  $(9.5 \times 10^2)(3.1 \times 10^4) = ?$
49. If  $x > 0$ ,  $\sqrt{x^3} = ?$
50. Factor  $2x - 8 + x^2 - 4x$
51. Solve  $x^2 - 3x - 4 = 0$
52. Simplify:  $(\sqrt{3} + 2)(\sqrt{3} - 4)$
53. Divide  $y^2 - 4y + 3$  by  $y - 1$

SOLUTIONS TO ELEMENTARY ALGEBRA REVIEW PROBLEMS

1. 
$$\begin{array}{r} 1203 \\ - 984 \\ \hline 219 \end{array}$$

2. 
$$\begin{array}{r} 56 \\ 68 \overline{)3808} \\ \underline{340} \\ 0408 \\ \underline{0408} \\ 0 \end{array}$$



4. 
$$\left(\frac{2}{5} - \frac{3}{2}\right) \div \left(\frac{1}{20} + \frac{1}{5}\right) =$$

Simplify what is in the parentheses first.

First ( ):  $\frac{2}{5} - \frac{3}{2}$  L. C. D. = 10  $\frac{4}{10} - \frac{15}{10} = \frac{-11}{10}$

Second ( ):  $\frac{1}{20} + \frac{1}{5}$  L. C. D. = 20  $\frac{1}{20} + \frac{4}{20} = \frac{5}{20} = \frac{1}{4}$

Now, divide:  $\frac{-11}{10} \div \frac{1}{4}$

Invert the divisor, multiply, and reduce:  $\frac{-11}{10} \times \frac{4}{1} = \frac{-22}{5}$

5. To prime factor 120, start with any factor of 120 and continue to break each factor down until all the factors are prime.

$$\begin{aligned} 120 &= \\ 2 \times 60 &= \\ 2 \times 2 \times 30 &= \\ 2 \times 2 \times 2 \times 15 &= \\ 2 \times 2 \times 2 \times 3 \times 5 &\text{ or } 2^3 \times 3 \times 5 \end{aligned}$$

6. The number inside the absolute value becomes positive.

a.  $|7| = 7$

b.  $|-7| = 7$

c.  $-|7| = -(7) = -7$

d.  $-|-7| = -(7) = -7$

7.  $2\frac{3}{4} + 5\frac{4}{5} =$  L. C. D. = 20

$$\begin{array}{r} 2\frac{3}{4} = 2\frac{15}{20} \\ + 5\frac{4}{5} = 5\frac{16}{20} \\ \hline 7\frac{31}{20} = 8\frac{11}{20} \end{array}$$

8. To add fractions with like denominators, keep the denominator and add the numerators.  $\frac{2}{x} + \frac{3}{x} = \frac{5}{x}$

9.  $\frac{3}{x} + \frac{5}{y}$  L. C. D. =  $xy$   $\frac{3y}{xy} + \frac{5x}{xy} = \frac{3y + 5x}{xy}$

10.  $\frac{r}{s} - \frac{x}{y}$  L. C. D. =  $sy$   $\frac{ry}{sy} - \frac{xs}{sy} = \frac{ry - xs}{sy}$

11. To solve a proportion, cross multiply and then solve the resulting equation.

$$\frac{2}{x} = \frac{11}{5} \quad 11x = 10 \quad x = \frac{10}{11}$$

12. You can write 3 as  $\frac{3}{1}$  and proceed as in #11.

$$\frac{9}{x-2} = 3 \quad \frac{9}{x-2} = \frac{3}{1}$$

Cross multiply first. Distribute the 3. Add 6 to both sides. Divide both sides by 3.

$$\begin{array}{l} 3(x-2) = 9 \\ 3x - 6 = 9 \\ 3x = 15 \\ x = 5 \end{array}$$

13.  $\frac{4x-2}{3x}$  If  $x = 2$ , then substitute 2 for  $x$ :  $\frac{4(2)-2}{3(2)} = \frac{8-2}{6} = \frac{6}{6} = 1$

14.  $\frac{12m^2-9}{3}$  Factor the numerator and then reduce if possible.

$$\frac{3(4m^2-3)}{3} = 4m^2 - 3$$

15. There is no way to factor the numerator or denominator. There are no common factors in the numerator and denominator. The problem is already in lowest terms.

$$\frac{12m^2 - 7}{3}$$

- 16.
- a.  $2^3 = 2 \cdot 2 \cdot 2 = 8$
  - b.  $3^4 = 3 \cdot 3 \cdot 3 \cdot 3 = 81$
  - c.  $(-2)^3 = -2 \cdot -2 \cdot -2 = -8$
  - d.  $(-2)^4 = -2 \cdot -2 \cdot -2 \cdot -2 = 16$
  - e.  $(-2)^5 = -2 \cdot -2 \cdot -2 \cdot -2 \cdot -2 = -32$
  - f.  $(-2)^6 = -2 \cdot -2 \cdot -2 \cdot -2 \cdot -2 \cdot -2 = 64$

- 17.
- |      |      |
|------|------|
| 1. E | 5. F |
| 2. A | 6. B |
| 3. C | 7. D |
| 4. G |      |

18.  $\frac{3(-2) - 8(-1)}{3(-4) + 2(-4)} =$  Multiply first.

$$\frac{-6 + 8}{-12 - 8} = \frac{2}{-20} = \frac{-1}{10} \text{ or } \frac{1}{-10}$$

19.  $4 + (-3)(-5) - 2(4) =$  Multiply first.  $4 + 15 - 8 = 19 - 8 = 11$
20.  $2x^2 + 6xy + 3y$  if  $x = 2$  and  $y = -3$ :  
 $2(2)^2 + 6(2)(-3) + 3(-3) = 2(4) + 12(-3) - 9 = 8 - 36 - 9 = -28 - 9 = -37$
21. Add  $-4x$  to both sides. Add  $-2$  to both sides. Divide both sides by 2.  
 $6x + 2 = 4x - 10$   
 $2x + 2 = -10$   
 $2x = -12$   
 $x = -6$
22.  $4(2 + x) + 5 = 2(3x - 4)$  Multiply to remove parentheses.  
 $8 + 4x + 5 = 6x - 8$  Combine like terms.  
 $4x + 13 = 6x - 8$  Add  $-4x$  to both sides.  
 $13 = 2x - 8$  Add 8 to both sides.  
 $21 = 2x$  Divide both sides by 2.  
 $\frac{21}{2} = x$

23.  $\frac{x}{6} - \frac{3x}{2} = 4$  Multiply both sides by 6.

$$6 \cdot \frac{x}{6} - 6 \cdot \frac{3x}{2} = 6 \cdot 4$$

$$x - 9x = 24$$

$$-8x = 24$$

$$x = -3$$

Divide both sides by  $-8$ .

24.  $M = 2x + y$  You need to multiply  $x$  by 2 because  $x$  people saw 2 movies.  
Multiply  $y$  by 1 because  $y$  people saw 1 movie. Multiply  $z$  by 0  
because  $z$  people saw 0 movies. Note:  $0z = 0$

25. To find the average, add all the grades and divide by the total number of tests taken.

$$72 + 83 + 72 + 94 + 76 = 397$$
$$\begin{array}{r} 79.4 \\ 5 \overline{)397.0} = \text{average test score} \\ \underline{35} \\ 047 \\ \underline{045} \\ 0020 \\ \underline{0020} \\ 0000 \end{array}$$

26. Let  $n$  = the other number  $\frac{n+9}{2} = -15$

$$n + 9 = -30$$

$$n = -39$$

Multiply both sides by 2.

Add  $-9$  to both sides.

The other number is  $-39$ .

27.  $C = 3b + 2d$

If it cost  $b$  dollars for one adult, then 3 adults cost  $3b$ .

If it cost  $d$  dollars for one child, then 2 children cost  $2d$ .

Add these together to get the total cost.

28. If Mary is  $n$  years old, then in 8 years she will be  $n + 8$  years old.

29. If Walt bought  $x$  apples yesterday and 7 apples today, then he bought  $x + 7$  apples altogether.







50. Factor  $2x - 8 + x^2 - 4x$   
 $= 2(x - 4) + x(x - 4)$  Factor by grouping  
 $= (2 + x)(x - 4)$  Common factor is  $(x - 4)$

51. Solve  $x^2 - 3x - 4 = 0$  Factor to get  $(x - 4)(x + 1) = 0$  Solve  $x - 4 = 0$  or  $x + 1 = 0$  to get  $x = 4$  or  $x = -1$

52. Simplify:  $(\sqrt{3} + 2)(\sqrt{3} - 4)$  Multiply by the "FOIL" method to get  $\sqrt{9} - 4\sqrt{3} + 2\sqrt{3} - 8$   
 $= 3 - 4\sqrt{3} + 2\sqrt{3} - 8 = -5 - 2\sqrt{3}$

53.

$$\begin{array}{r} \frac{y - 3}{y - 1} \ ) \ y^2 - 4y + 3 \\ \underline{y^2 - y} \phantom{+ 3} \\ -3y + 3 \phantom{+ 3} \\ \underline{-3y + 3} \\ 0 \end{array}$$

Remember you are subtracting  
Remember you are subtracting