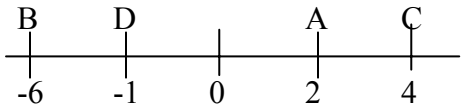
REVIEW PROBLEMS FOR ELEMENTARY ALGEBRA ASSESSMENT TEST-Rev 1

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. $4(x + 2) = 4x + 8$	a. Associative for Addition
2. $x + (y + z) = (x + y) + z$	b. Associative for Multiplication
3. $A + 0 = A$	c. Additive Identity
4. $3 \bullet \frac{1}{3} = 1$	d. Multiplicative Identity
5. $5 + -5 = 0$	e. Distributive
6. $5 \bullet (2 \bullet 4) = (5 \bullet 2) \bullet 4$	f. Additive Inverse
7. $Y \bullet 1 = Y$	g. Multiplicative Inverse

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

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 $x^2 - 3x - 4 = 0$

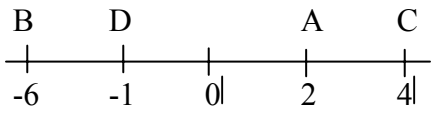
52. Simplify: $(\sqrt{3} + 2)(\sqrt{3} - 4)$

53. Divide y2 - 4y + 3 by y - 1

SOLUTIONS TO ELEMENTARY ALGEBRA REVIEW PROBLEMS

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

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

3. 

Distance B to A is 8 units.
Distance D to C is 5 units.
Distance B to D is 5 units.
Distance A to C is 2 units.

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.

120 =
2 x 60 =
2 x 2 x 30 =
2 x 2 x 2 x 15 =
2 x 2 x 2 x 3 x 5 or 2^3 x 3 x 5

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

$$2\frac{3}{4}=2\frac{15}{20}$$
$$+5\frac{4}{5}=5\frac{16}{20}$$
$$7\frac{31}{20}=8\frac{11}{20}$$

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.

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

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

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

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

$3(x-2)=9$
$3x-6=9$
$3x=15$
$x=5$

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

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.

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

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.

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

$x - 9x = 24$
$-8x = 24$ Divide both sides by –8.
$x = -3$

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.

$72 + 83 + 72 + 94 + 76 = 397$

$$5\overline{)397.0} \quad \begin{array}{r} 79.4 \\ \\ \underline{35} \\ 047 \\ \underline{045} \\ 0020 \\ \underline{0020} \\ 0000 \end{array}$$

= average test score

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

$n + 9 = -30$ Multiply both sides by 2.
$n = -39$ 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.

30. The entire meal consists of 5g + 20g + 7g = 32 grams
Fat is 7 grams out of the 32 or $\frac{7}{32}$

31. a. $5 - 3 = 2$ b. $7 - (-2) = 7 + 2 = 9$
c. $6 - (-7) = 6 + 7 = 13$ d. $-4 - 3 = -7$

32. 7, -3 and 4^2 represent integers. (Integers are positive and negative whole nos. and 0.)

33. To solve a proportion, cross-multiply and solve the resulting equation.
$\frac{x}{5} = \frac{20}{3}$ $3x = 100$ $x = 33\frac{1}{3}$

34. $\frac{2x-1}{3} = \frac{x+2}{4}$ See the explanation for #33.

$4(2x - 1) = 3(x + 2)$ Multiply to remove parentheses.
$8x - 4 = 3x + 6$ Add $-3x$ and 4 to both sides.
$5x = 10$ Divide by 5.
$x = 2$

35. $2x + 3 < 10$ Add -3 to both sides.
$2x < 7$ Divide by 2.
$x < \frac{7}{2}$

36. $-\frac{4}{5}x \geq 20$ Multiply by $-\frac{5}{4}$, being careful to remember that when you multiply an inequality by a negative, the inequality reverses.

$x \leq 20\left(-\frac{5}{4}\right)$

$x \leq -25$

37. $x^2 + 15x + 50$ You are looking for two numbers which multiply to equal 50 and add to equal 15. The two numbers are 10 and 5.

$x^2 + 15x + 50 = (x + 10)(x + 5)$

38. $6x + 10$ There is a common factor of 2.

$6x + 10 = 2(3x + 5)$

39. $\sqrt{\frac{25}{16}} = \frac{\sqrt{25}}{\sqrt{16}} = \frac{5}{4}$

40. $\frac{1}{4}[5x - 7y - (x + y)] =$ Simplify the innermost parentheses first:

$\frac{1}{4}[5x - 7y - x - y] =$ Combine like terms.

$\frac{1}{4}[4x - 8y] = x - 2y$ Distribute the 1/4

41. Area of a square = s^2. If s = 8, then the area is $8^2 = 64$ square units.

42. Area of a rectangle = L x W. If L = 6 and W = 5. Then A = (6)(5) = 30 square units.

43. Area of a triangle = $\frac{1}{2}bh$. If b = 10 and h = 3, then

$A = \frac{1}{2}(10)(3) = 5(3) = 15$ square units.

44. $6^2 = 6 \bullet 6 = 36$

45. $(x + 2)^2 = (x + 2)(x + 2) = x^2 + 2x + 2x + 4 = x^2 + 4x + 4$

46. $8.8 \times 10^4 = 8.8 \times 10000 = 88000$ (Move the decimal 4 places to the right.)

47. $2.5 \times 10^{-3} = 2.5 \times 0.001 = .0025$ (Move the decimal 3 places to the left.)

48. $(9.5 \times 10^2)(3.1 \times 10^4) = 29.45 \times 10^6 = 2.945 \times 10^7$ Add exponents when multiplying. Put the decimal after the first number in scientific notation, which requires that we add one to the exponent to compensate.

49. $\sqrt{x^3} = \sqrt{x^2 \bullet x} = \sqrt{x^2}\sqrt{x} = x\sqrt{x}$

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.

$$y-1 \overline{)\, y^2 - 4y + 3}$$

$y - 3$

$y^2 - y$

$-3y+3$ Remember you are subtracting

$-3y+3$ Remember you are subtracting

0