Algebra Prerequisite Skills Summer Packet

The problems in this packet are designed to help review topics from previous mathematics courses that are important to your success in Algebra. Please try to do each problem, as these are topics you will need to know for Algebra.

The following list of websites might be helpful to explore if you are interested in more practice or further explanations of concepts:

www.aaamath.com
www.mathdrill.com/mathapp.php3
www.coolmath4kids.com
www.mathforum.com

I. Use order of operation to determine each answer:

1) $4 \bullet 16 + 8 - 0 \div 5$ _____

2) $8 (3 + 4) - 2 \bullet 8 \div (5 - 3)$ _____

3) $(8^2 + (13 - 4)^2) \div 5$ _____

II. Insert parenthesis to make the following equation true:

4) $8 + 12 \div 4 \bullet 5 = 1$

III. Determine the answer for each problem

5) $29 - 100 =$ _____

6) $10 \bullet (-2 \bullet 18) =$ _____

7) $-844/4 =$ _____

8) $-777 - (-801) =$ _____

IV. Evaluate Expressions: Evaluate each expression when a = -2, b = 4 and c = -10

9) $2a + b$

10) $ac - b$

11) $8a + 5b$

12) $\frac{a + b}{a}$

13) $\frac{3c}{-5}$

14) $-4a - b$

V. Solve Equations Show all steps

15) $5x = 210$

16) $\frac{3}{8} x = 36$

17) $2x - 10 = 44 + 8x$

18) $7x - 4 = 20 + 3x$

19) $2(x - 3) = -20$

20) $15 - 4x + 5 = 32$

21) $2x - 3x + 5 = 18$

22) $15 = 7x - 3x - 2$

23) $155 = 6x - 3 + 4x$

24) $15 - 3x - x = -5$

VI. Solve Inequalities: Show all steps and graph on a number line

25) $4x + 7 > 37$

26) $-5x + 9 \geq 24$

27) $7x - 28 \geq -7$

28) $3x - 5 \leq 2x - 13$

VII. Solve the percent problems:

29) What number is 63% of 53?

30) What percent of 23 is 14?

31) Find a number so that 2% of it is 128?

VIII. Write an algebraic equation and then solve:

32) Eight times a number, increased by 6 is 62. What is the number?

33) A number divided by 6 is 25. What is the number?

IX. Set up an equation and solve;

34) A television rating service found that out of a sample of 100 households, 35 were watching an Orangetown TV during its time slot. Suppose there are 210,000 households in a marketing region, how many of them would you expect to be watching Orangetown TV?

X. Find the Greatest Common Factor (GCF) of the following:

35) 36 and 40 _____ 36) 6,12, and 21 _____

XI. Name all the possible factors:

37) 24 _____

38) 55 _____

XII. Statistics

Mr. Smith teachers two math classes. The table below shows the recent test scores for his students.

Class A	56	57	57	59	65	67	68	70	72	75	88	89	91	95	96	98	99
Class B	62	73	76	79	79	83	84	84	85	87	87	87	90	92	93	93	95

39) Calculate the mean, median and mode of each class separately.

Mean class A_____ Mean class B_____

Median class A _____ Median class B_____

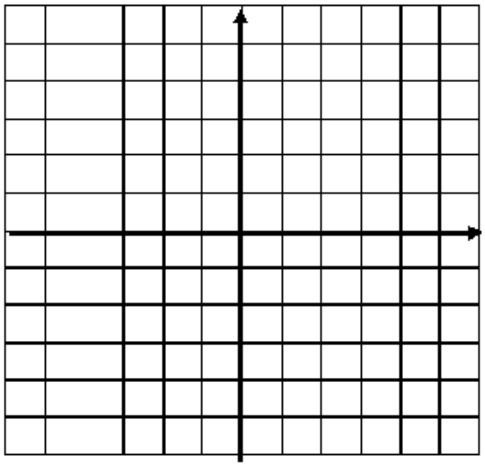
Mode class A _____ Mode class B_____

40) Overall which class did better on the test? Use mathematics to justify your answer. Be sure to give specific examples.

XIII. Graphing

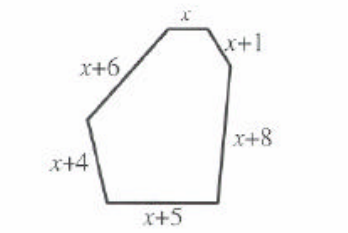
Plot each of the following points on the grid below. Use the letter to label the point on the graph.

41) A(3,0) B(5,5) C(-1,2) D(-3,-2) E(0,-3)



Answer in complete sentences where appropriate. Show all your work to receive full credit.

42) The perimeter of the figure below is equal to 150 cm.



- What is the length of the longest side of the polygon? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

XIV. Number properties

43. Match the property with its correct name

1. $x + (y + z) = (x + y) + z$	a. Additive Inverse Property
2. $(pq) \cdot 1 = pq$	b. Multiplicative Inverse Property
3. $(5x)y = 5(xy)$	c. Commutative Property of Multiplication
4. $a + 5b = 5b + a$	d. Multiplicative Identity
5. $a + 0 = a$	e. Commutative Property of Addition
6. $gh = hg$	f. Associative Property of Addition
7. $8 + (-8) = 0$	g. Distributive Property
8. $x \cdot 0 = 0$	h. Associative Property of Multiplication
9. $5 \cdot \left(\frac{1}{5}\right) = 1$	i. Additive Identity Property
10. $2(a + b) = 2a + 2b$	j. Zero Property

I. Use order of operation to determine each answer:

1) $4 \bullet 16 + 8 - 0 \div 5$ 72

2) $8\,(3 + 4) - 2 \bullet 8 \div (5 - 3)$ 48

3) $(8^2 + (13 - 4)^2) \div 5$ 29

II. Insert parenthesis to make the following equation true:

4) $(8 + 12) \div (4 \bullet 5) = 1$

III. Determine the answer for each problem

5) $29 - 100 =$ -71

6) $10 \bullet (-2 \bullet 18) =$ -360

7) $-844/4 =$ -211

8) $-777 - (-801) =$ 24

IV. Evaluate Expressions: Evaluate each expression when a = -2, b = 4 and c = -10

9) $2a + b = 0$

10) $ac - b = 16$

11) $8a + 5b = 4$

12) $\frac{a + b}{a} = -1$

13) $\frac{3c}{-5} = 6$

14) $-4a - b = 4$

V. Solve Equations Show all steps

15) $\frac{5x}{5} = \frac{210}{5}$

$x = 42$

16) $\frac{3/8\,x}{3/8} = \frac{36}{3/8}$

$x = 96$

17) $2x - 10 = 44 + 8x$

$-2x \quad -2x$

$-10 = 44 + 6x$

$-44 \quad -44$

$\frac{-54}{6} = \frac{6x}{6}$

$-9 = x$

18) $7x - 4 = 20 + 3x$

$-3x \quad -3x$

$4x - 4 = 20$

$+4 \quad +4$

$\frac{4x}{4} = \frac{24}{4}$

$x = 6$

19) $2(x - 3) = -20$

$2x - 6 = -20$

$+6 \quad +6$

$\frac{2x}{2} = \frac{-14}{2}$

$x = -7$

20) $15 - 4x + 5 = 32$

$20 - 4x = 32$

$-20 \quad -20$

$\frac{-4x}{-4} = \frac{12}{-4}$

$x = -3$

21) $2x - 3x + 5 = 18$

$-x + 5 = 18$

$-5 \quad -5$

$\frac{-x}{-1} = \frac{13}{-1}$

$x = -13$

22) $15 = 7x - 3x - 2$

$15 = 4x - 2$

$+2 \quad +2$

$\frac{17}{4} = \frac{4x}{4}$

$4\frac{1}{4} = x$

23) $155 = 6x - 3 + 4x$

$155 = 10x - 3$

$+3 \quad +3$

$\frac{158}{10} = \frac{10x}{10}$

$15.8 = x$

24) $15 - 3x - x = -5$

$15 - 4x = -5$

$-15 \quad -15$

$\frac{-4x}{-4} = \frac{-20}{-4}$

$x = 5$

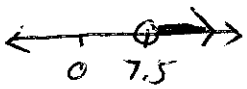
VI. Solve Inequalities: Show all steps and graph on a number line

25) $4x + 7 > 37$

$-7 \quad -7$

$\frac{4x}{4} > \frac{30}{4}$

$x > 7.5$

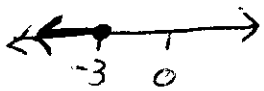


26) $-5x + 9 \geq 24$

$-9 \quad -9$

$\frac{-5x}{-5} \geq \frac{15}{-5}$

$x \leq -3$

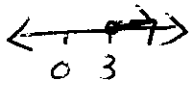


27) $7x - 28 \geq -7$

$+28 \quad +28$

$\frac{7x}{7} \geq \frac{21}{7}$

$x \geq 3$



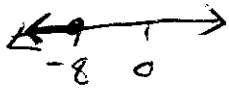
28) $3x - 5 \leq 2x - 13$

$-2x \quad -2x$

$x - 5 \leq -13$

$+5 \quad +5$

$x \leq -8$



VII. Solve the percent problems:

29) What number is 63% of 53? 33.39

30) What percent of 23 is 14? 60.9%

31) Find a number so that 2% of it is 128? 6400

VIII. Write an algebraic equation and then solve:

32) Eight times a number, increased by 6 is 62. What is the number?

Let x = the #

$8x + 6 = 62$

$-6 \quad -6$

$\frac{8x}{8} = \frac{56}{8}$

$x = 7$

The number is 7.

33) A number divided by 6 is 25. What is the number?

Let x = the #

$6\left(\frac{x}{6}\right) = (25)6$

$x = 150$

The number is 150

IX. Set up an equation and solve;

34) A television rating service found that out of a sample of 100 households, 35 were watching an Orangetown TV during its time slot. Suppose there are 210,000 households in a marketing region, how many of them would you expect to be watching Orangetown TV?

$\frac{35}{100} = \frac{x}{210,000}$ $100x = 7350000$ $x = 73,500$

X. Find the Greatest Common Factor (GCF) of the following:

35) 36 and 40 4 36) 6,12, and 21 3

XI. Name all the possible factors:

37) 24 1, 2, 3, 4, 6, 8, 12, 24

38) 55 1, 5, 11, 55

XII. Statistics

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Class B	62	73	76	79	79	83	84	84	85	87	87	87	90	92	93	93	95

39) Calculate the mean, median and mode of each class separately.

Mean class A 76.6 Mean class B 84

Median class A 72 Median class B 85

Mode class A 57 Mode class B 87

40) Overall which class did better on the test? Use mathematics to justify your answer. Be sure to give specific examples.

Class B did better. They had A higher Mean and Median

XIII. Graphing

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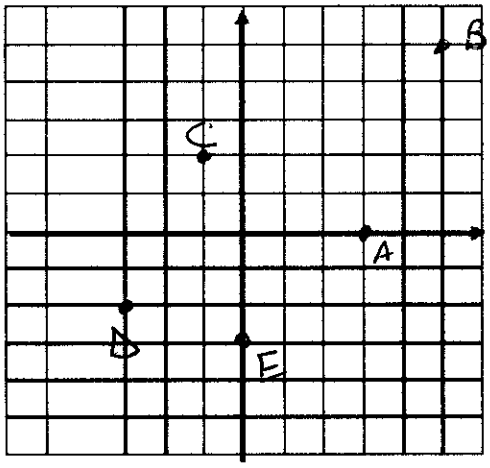

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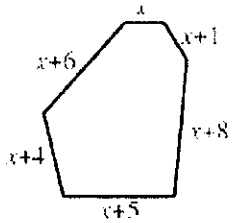

- What is the length of the longest side of the polygon? Use mathematics to explain how you determined your answer. Use words, symbols, or both in your explanation.

$x + x+1 + x+8 + x+5 + x+4 + x+6 = 150$

$6x + 24 = 150$

$-24 \quad -24$

$\frac{6x}{6} = \frac{126}{6}$

$x = 21$

$x+8 = 21+8 = 29$

XIV. Number properties

43. Match the property with its correct name

1. $x + (y - z) = (x + y) + z$ F
2. $(pq) \cdot 1 = pq$ D
3. $(5x)y = 5(xy)$ H
4. $a + 5b = 5b - a$ E
5. $a + 0 = a$ I
6. $gh = hg$ C
7. $8 + (-8) = 0$ A
8. $x \cdot 0 = 0$ J
9. $5 \cdot \left(\frac{1}{5}\right) = 1$ B
10. $2(a + b) = 2a + 2b$ G

a. Additive Inverse Property

b. Multiplicative Inverse Property

c. Commutative Property of Multiplication

d. Multiplicative Identity

e. Commutative Property of Addition

f. Associative Property of Addition

g. Distributive Property

h. Associative Property of Multiplication

i. Additive Identity Property

j. Zero Property