



Incoming 8th Grade Summer Packet

Algebra 8

Dear Incoming 8th grade student,

Welcome to Sayreville Middle School and your math course for the 2026-2027 school year! There is much to learn this year, and each class session during school will require you to work diligently, both inside and outside of the classroom. This summer Math packet addresses the material that you should be comfortable with before starting Algebra 8!

This math packet serves 2 purposes:

1. It will allow you to remain mathematically fresh during the summer
2. It will enable you to “hit the ground running” when this course begins.

This packet should be completed and brought with you on the first day of school. Use the answer key provided to check your work. If you come across questions that you are unsure of, make a note and bring that up to your teacher during the review. It would be a mistake to complete this packet immediately upon completion of this past school year as well as waiting until just before the next school year begins. Take some time off and look towards beginning the packet mid-summer. It is important that the techniques practiced in this packet are fresh in your mind come the first day of school.

You will be assessed on this content within the first week of school!

Good Luck!

ANSWER KEY

VARIABLES & EXPRESSIONS

Translate each algebraic expression or verbal expression.

VERBAL EXPRESSION	ALGEBRAIC EXPRESSION
8 times a number x is subtracted by 4	$8x - 4$
the product of 6 and a number x squared is increased by 7	$6x^2 + 7$
5 increased by the product of -3 and a number x	$5 - 3x$
3 times the number x plus 4 times the number y is decreased by 2	$3x + 4y - 2$
3 times the sum of a number x and 7	$3(x + 7)$
the quotient of x and 2 is added by the product of 4 and x	$\frac{x}{2} + 4x$
A number y cubed plus x squared decreased by 7	$y^3 + x^2 - 7$
5 times the difference of x and 4 is added by 2	$5(x - 4) + 2$
the difference of x and y is divided by 3 and added by 8	$\frac{x - y}{3} + 8$
negative 2 times the square of the sum of a number x and 4 is subtracted by 1	$-2(x + 4)^2 - 1$

ORDER OF OPERATIONS

Simplify each expression using the order of operations.

1. $5 - 6 + 2(3)$ $5 - 6 + 6$ $-1 + 6$ 5	2. $4 + 5(7 - 1) + \frac{8}{2}$ $4 + 5(6) + 4$ $4 + 30 + 4$ $34 + 4$ 38
3. $-9(4 + 2) - 2(3) + 4^2$ $-9(6) - 6 + 16$ $-54 - 6 + 16$ $-60 + 16$ -44	4. $7 - 2[-6 - (3 + 1)] - \frac{8 + 7}{3}$ $7 - 2[-6 - 4] - \frac{15}{3}$ $7 - 2[-10] - 5$ $7 + 20 - 5$ $27 - 5$ 22
5. $0.5(-8 - 4) + 3(8 - 2^2)$ $0.5(-12) + 3(8 - 4)$ $0.5(-12) + 3(4)$ $-6 + 12$ 6	6. $3 - 5(2) - 7(5^2 - 4^2)$ $3 - 10 - 7(25 - 16)$ $3 - 10 - 7(9)$ $3 - 10 - 63$ $-7 - 63$ -70
7. $2(3)^2 - 4(3) + 1$ $2(9) - 12 + 1$ $18 - 12 + 1$ $6 + 1$ 7	8. $4(3 - 5)^3 + 5$ $4(-2)^3 + 5$ $4(-8) + 5$ $-32 + 5$ -27

EVALUATING EXPRESSIONS

Evaluate each expression given the following values for each variable.

$a = 2$	$b = -3$	$c = 4$	$d = -5$	$e = 6$	$f = -7$
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1. $2a + 3d$ $2(2) + 3(-5)$ $4 + 3(-5)$ $4 - 15$ -11	2. $b^2 - e^2$ $(-3)^2 - (6)^2$ $9 - 36$ -27
3. $-3c - (a + d) + f$ $-3(4) - [2 + (-5)] + (-7)$ $-12 - [-3] - 7$ $-12 + 3 - 7$ $-9 - 7$ -16	4. $2(b - e) + (f + c)^2$ $2(-3 - 6) + (-7 + 4)^2$ $2(-9) + (-3)^2$ $-18 + 9$ -9
5. $\frac{d - c}{3} - 4(ab + f)$ $\frac{-5 - 4}{3} - 4[2(-3) + (-7)]$ $\frac{-9}{3} - 4[-6 - 7]$ $-3 - 4[-13]$ $-3 + 52$ 49	6. $c(ab - 1) + de - f^2$ $4[(2)(-3) - 1] + (-5)(6) - (-7)^2$ $4[-6 - 1] - 30 - 49$ $4[-7] - 30 - 49$ $-28 - 30 - 49$ $-58 - 49$ -107

ADDING & SUBTRACTING FRACTIONS

Add or subtract the fractions. Simplify your answer.

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

$$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$$

$$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$$

$$\frac{2}{5} - \frac{1}{5} = \frac{1}{5}$$

$$\frac{3}{6} - \frac{5}{6} = -\frac{2}{6} = -\frac{1}{3}$$

$$\frac{1}{7} - \frac{8}{7} = -\frac{7}{7} = -1$$

$$\frac{5}{8} - \frac{7}{8} = -\frac{2}{8} = -\frac{1}{4}$$

$$-\frac{5}{9} - \frac{1}{9} = -\frac{6}{9} = -\frac{2}{3}$$

$$-\frac{3}{10} + \frac{7}{10} = \frac{4}{10} = \frac{2}{5}$$

$$\begin{aligned} \frac{1}{2} + \frac{5}{4} &= \frac{2}{4} + \frac{5}{4} \\ &= \frac{7}{4} \end{aligned}$$

$$\begin{aligned} \frac{2}{9} + \frac{1}{3} &= \frac{2}{9} + \frac{3}{9} \\ &= \frac{5}{9} \end{aligned}$$

$$\begin{aligned} \frac{1}{4} + \frac{2}{16} &= \frac{4}{16} + \frac{2}{16} \\ &= \frac{6}{16} = \frac{3}{8} \end{aligned}$$

$$\begin{aligned} \frac{2}{3} - \frac{1}{5} &= \frac{10}{15} - \frac{3}{15} \\ &= \frac{7}{15} \end{aligned}$$

$$\begin{aligned} \frac{3}{6} - \frac{5}{4} &= \frac{6}{12} - \frac{15}{12} \\ &= -\frac{9}{12} = -\frac{3}{4} \end{aligned}$$

$$\begin{aligned} \frac{1}{2} - \frac{8}{7} &= \frac{7}{14} - \frac{16}{14} \\ &= -\frac{9}{14} \end{aligned}$$

$$\begin{aligned} \frac{5}{8} - \frac{7}{5} &= \frac{25}{40} - \frac{56}{40} \\ &= -\frac{31}{40} \end{aligned}$$

$$\begin{aligned} -\frac{5}{4} - \frac{1}{9} &= -\frac{45}{36} - \frac{4}{36} \\ &= -\frac{49}{36} \end{aligned}$$

$$\begin{aligned} -\frac{3}{10} + \frac{7}{3} &= -\frac{9}{30} + \frac{70}{30} \\ &= \frac{61}{30} \end{aligned}$$

MULTIPLYING & DIVIDING FRACTIONS

Multiply or divide the fractions. Simplify your answer.

$$\frac{5}{2} \cdot \frac{1}{2} = \frac{5}{4}$$

$$\frac{1}{3} \cdot \frac{1}{3} = \frac{1}{9}$$

$$\frac{1}{4} \cdot \frac{2}{4} = \frac{2}{16} = \frac{1}{8}$$

$$-\frac{2}{5} \cdot \frac{3}{5} = -\frac{6}{25}$$

$$\frac{3}{6} \cdot -\frac{5}{6} = -\frac{15}{36}$$

$$-\frac{1}{4} \cdot -\frac{8}{7} = -\frac{8}{28} = -\frac{2}{7}$$

$$4\left(\frac{5}{8}\right) = \frac{20}{8} = \frac{5}{2}$$

$$-3\left(\frac{2}{3}\right) = -\frac{6}{3} = -2$$

$$-2\left(\frac{4}{9}\right) = -\frac{8}{9}$$

$$\begin{aligned} \frac{1}{2} \div \frac{5}{4} &= \frac{1}{2} \cdot \frac{4}{5} \\ &= \frac{4}{10} = \frac{2}{5} \end{aligned}$$

$$\begin{aligned} \frac{2}{9} \div \frac{1}{3} &= \frac{2}{9} \cdot \frac{3}{1} \\ &= \frac{6}{9} = \frac{2}{3} \end{aligned}$$

$$\begin{aligned} \frac{1}{4} \div \frac{2}{5} &= \frac{1}{4} \cdot \frac{5}{2} \\ &= \frac{5}{8} \end{aligned}$$

$$\begin{aligned} -\frac{2}{3} \div \frac{1}{5} &= -\frac{2}{3} \cdot \frac{5}{1} \\ &= -\frac{10}{3} \end{aligned}$$

$$\begin{aligned} \frac{3}{6} \div -\frac{5}{4} &= \frac{3}{6} \cdot -\frac{4}{5} \\ &= -\frac{12}{30} = -\frac{2}{5} \end{aligned}$$

$$\begin{aligned} -\frac{1}{2} \div -\frac{8}{7} &= -\frac{1}{2} \cdot -\frac{7}{8} \\ &= \frac{7}{16} \end{aligned}$$

COMBINING LIKE TERMS

Combine like terms for each expression.

EXPRESSION	SIMPLIFIED
$x + x + 3x + y$	$5x + y$
$y + 2y + 5x + x$	$6x + 3y$
$5 + z + z + 4z - 6$	$6z - 1$
$3x + 4x - 5$	$7x - 5$
$5c + 2b - 3c$	$2b + 2c$
$x + y + 2x$	$3x + y$
$6a - 5b + a$	$7a - 5b$
$4 + 3x - 7 - 8x$	$-5x - 3$
$3(x + 2) - 4$	$3x + 2$
$-5(x - 3) + 7x$	$2x + 15$
$5m - 6n - 9m$	$-4m - 6n$
$-8a - 9b - 10a + 9b$	$-18a$
$2(x + 4) + 5x - 3$	$7x + 5$
$-10(2 + x) - 3x$	$-13x - 20$

SOLVING ONE-STEP EQUATIONS

Solve the one-step equations.

$$\begin{array}{r} x + 7 = 9 \\ -7 \quad -7 \\ \hline x = 2 \end{array}$$

$$\begin{array}{r} 5 + x = -3 \\ -5 \quad -5 \\ \hline x = -8 \end{array}$$

$$\begin{array}{r} 6 = x + 8 \\ -8 \quad -8 \\ \hline -2 = x \end{array}$$

$$\begin{array}{r} x - 9 = 1 \\ +9 \quad +9 \\ \hline x = 10 \end{array}$$

$$\begin{array}{r} -5 + x = -2 \\ +5 \quad +5 \\ \hline x = 3 \end{array}$$

$$\begin{array}{r} 4 = x - 7 \\ +7 \quad +7 \\ \hline 11 = x \end{array}$$

$$\begin{array}{r} 5x = 75 \\ 5 \quad 5 \\ \hline x = 15 \end{array}$$

$$\begin{array}{r} -2x = -64 \\ -2 \quad -2 \\ \hline x = 32 \end{array}$$

$$\begin{array}{r} -7.5 = 1.25x \\ -1.25 \quad -1.25 \\ \hline -6 = x \end{array}$$

$$\begin{array}{r} (4) \frac{x}{4} = 7 (4) \\ \hline x = 28 \end{array}$$

$$\begin{array}{r} (-2) - \frac{x}{2} = 8 (-2) \\ \hline x = -16 \end{array}$$

$$\begin{array}{r} (-9) - 3 = -\frac{x}{9} (-9) \\ \hline 27 = x \end{array}$$

$$\begin{array}{r} (\frac{4}{3}) \frac{3}{4}x = 7 (\frac{4}{3}) \\ \hline x = \frac{28}{3} \end{array}$$

$$\begin{array}{r} -(\frac{2}{1}) - \frac{1}{2}x = 8 -(\frac{2}{1}) \\ \hline x = -16 \end{array}$$

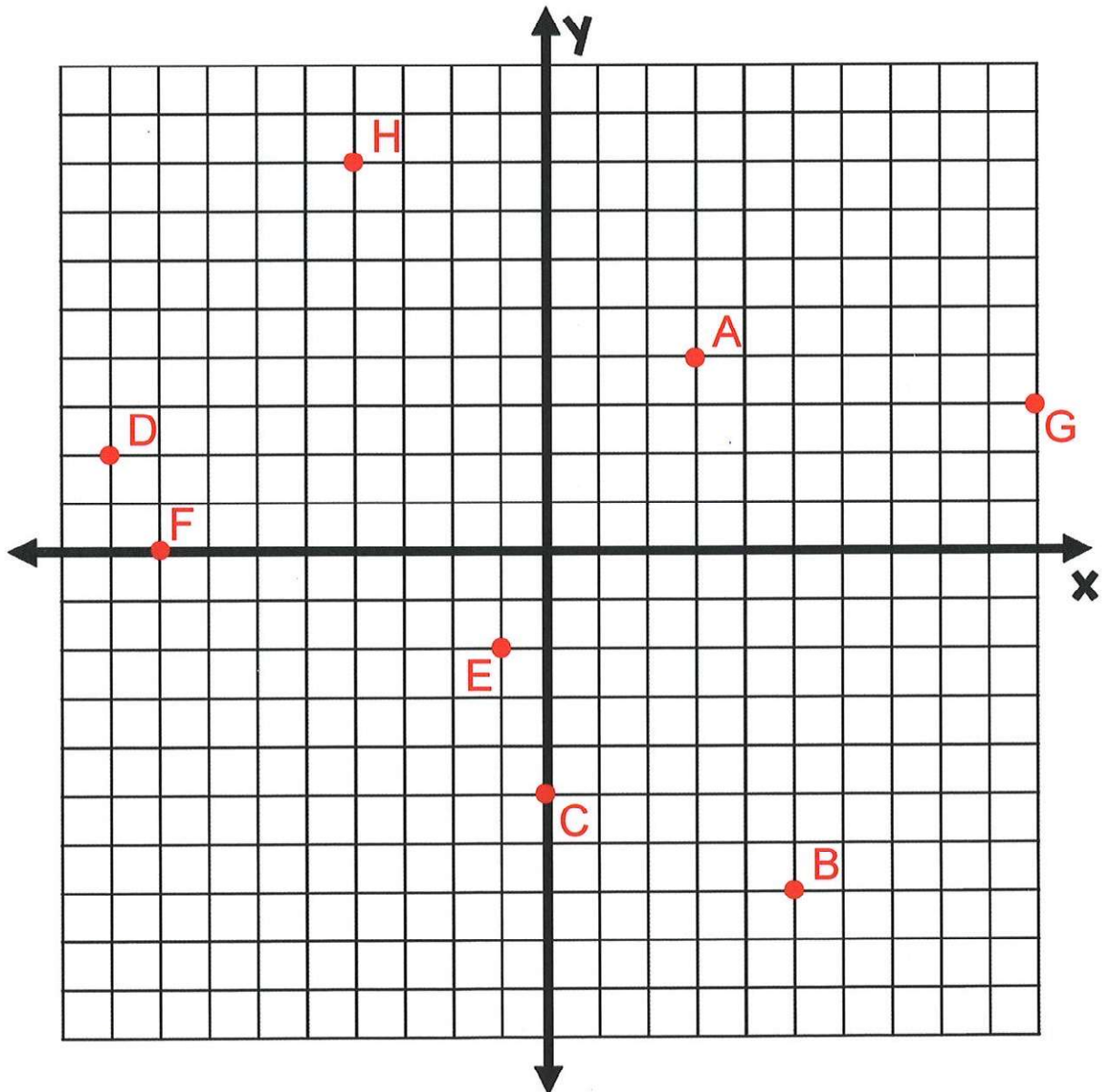
$$\begin{array}{r} -(\frac{9}{2}) - 5 = -\frac{2}{9}x -(\frac{9}{2}) \\ \hline \frac{45}{2} = x \end{array}$$

THE COORDINATE PLANE

Plot each point on the coordinate plane and name the quadrant the point is in.

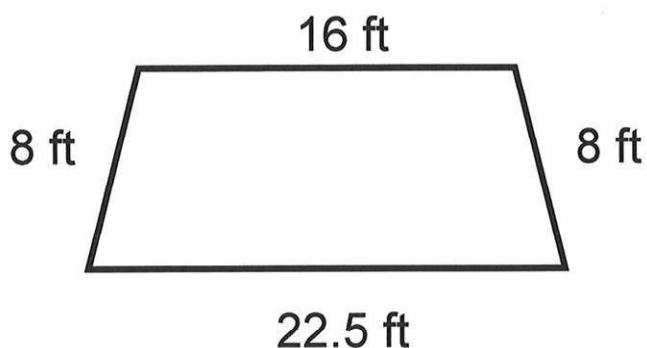
POINT	QUADRANT
A(3, 4)	I
B(5, -7)	IV
C(0, -5)	y-axis
D(-9, 2)	II

POINT	QUADRANT
E(-1, -2)	III
F(-8, 0)	x-axis
G(10, 3)	I
H(-4, 8)	II



CALCULATING PERIMETER

Determine the perimeter of each figure.

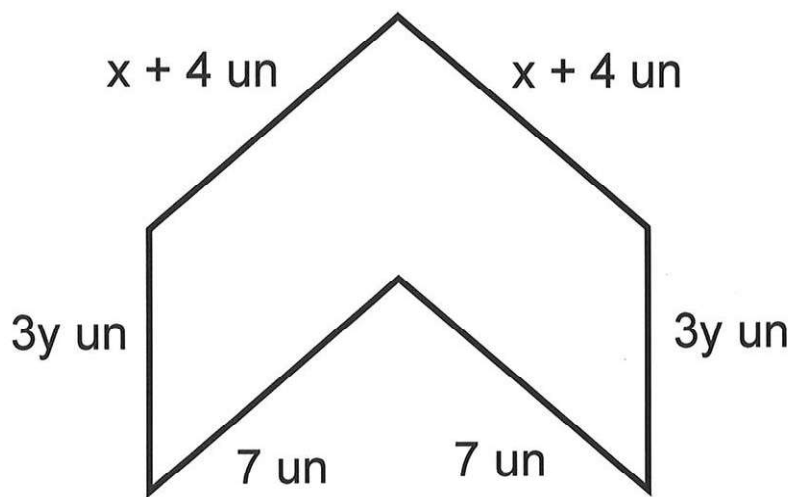
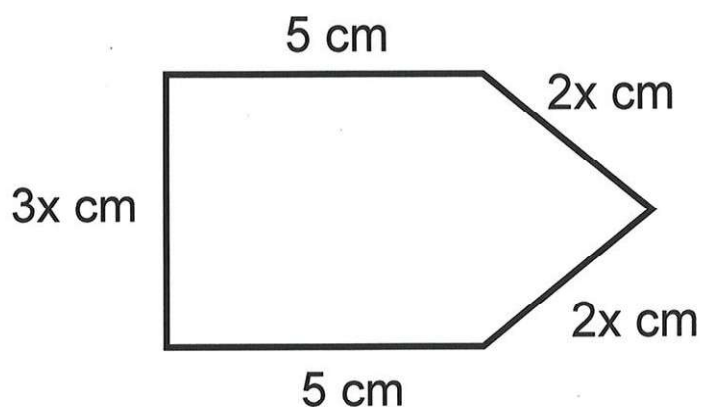


$$P = 16 + 8 + 22.5 + 8$$

$$P = 54.5 \text{ ft}$$

$$P = 5 + 2x + 2x + 5 + 3x$$

$$P = 7x + 10 \text{ cm}$$

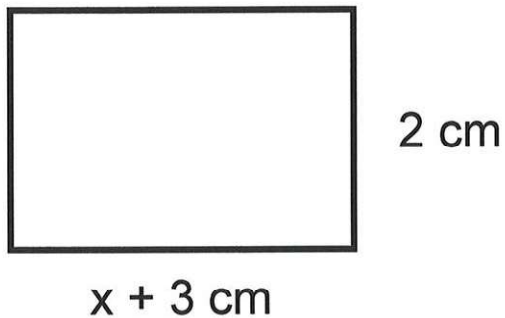


$$P = x + 4 + x + 4 + 3y + 3y + 7 + 7$$

$$P = 2x + 6y + 22 \text{ un}$$

CALCULATING AREA

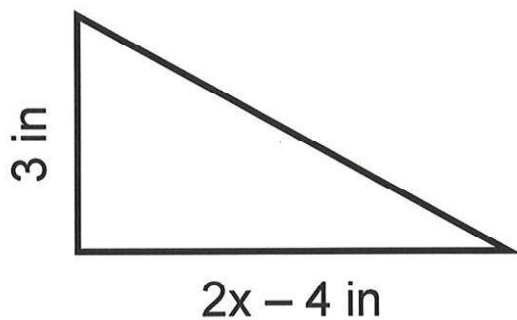
Determine the area of each figure.



$$A = \text{length} \cdot \text{width}$$

$$A = (x + 3)2$$

$$A = 2x + 6\text{ cm}^2$$



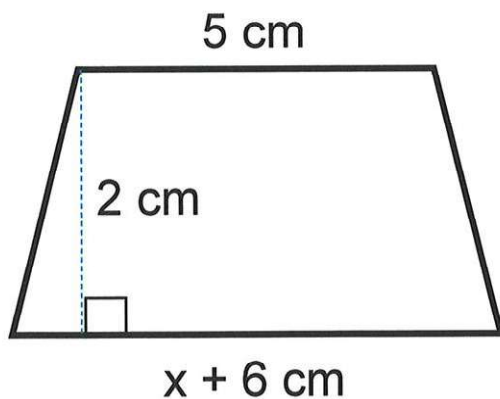
$$A = \frac{1}{2} \text{ base} \cdot \text{height}$$

$$A = \frac{1}{2}(2x - 4)(3)$$

$$A = \frac{1}{2}(2x - 4)(3)$$

$$A = 1.5(2x - 4)$$

$$A = 3x - 6\text{ in}^2$$



$$A = \frac{1}{2} \text{ height}(\text{base 1} + \text{base 2})$$

$$A = \frac{1}{2}(2)(5 + x + 6)$$

$$A = 5 + x + 6$$

$$A = x + 11\text{ cm}^2$$

PERFECT SQUARE NUMBERS

Complete the perfect squares chart. Fill in as many as you can without a calculator.

$1^2 =$	1	$16^2 =$	256
$2^2 =$	4	$17^2 =$	289
$3^2 =$	9	$18^2 =$	324
$4^2 =$	16	$19^2 =$	361
$5^2 =$	25	$20^2 =$	400
$6^2 =$	36	$21^2 =$	441
$7^2 =$	49	$22^2 =$	484
$8^2 =$	64	$23^2 =$	529
$9^2 =$	81	$24^2 =$	576
$10^2 =$	100	$25^2 =$	625
$11^2 =$	121	$30^2 =$	900
$12^2 =$	144	$40^2 =$	1600
$13^2 =$	169	$50^2 =$	2500
$14^2 =$	196	$60^2 =$	3600
$15^2 =$	225	$70^2 =$	4900