

a stem school

math skills sharpeners

2025 summer math workbook

FRÖEBEL
BILINGUAL SCHOOL
Home of the Space Generation

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A STEM School



2025 summer math skills sharpener *going to ninth grade*

student's name	date
teacher coming from	score
teacher going to	
parent's signature	date received

SKILLS SHARPENER FOR STUDENTS GOING TO NINTH GRADE MATH

WEEK 1.

Day 1.1 - Write the fraction as a decimal.

1) $\frac{8}{25}$

2) $\frac{-5}{18}$

3) $1\frac{9}{20}$

4) $1\frac{6}{11}$

Day 1.2 - Write the decimal as a fraction.

1) 0.25

2) $0.\bar{5}$

3) -0.3

4) 0.4

Day 1.3 - Find the sum or difference and simplify.

1) $\frac{3}{8} + \frac{2}{8}$

2) $\frac{-1}{6} + \frac{5}{6}$

3) $\frac{2}{15} - \frac{7}{15}$

4) $\frac{1}{12} - \left(\frac{-7}{12}\right)$

5) $1\frac{1}{2} + 1\frac{1}{2}$

6) $6\frac{2}{3} + 3\frac{1}{3}$

7) $4\frac{1}{5} - 2\frac{3}{5}$

8) $-3\frac{2}{7} - 6\frac{3}{7}$

Day 1.4 - Simplify the expression.

1) $\frac{5x}{8} + \frac{x}{8}$

2) $\frac{2n}{15} + \frac{7n}{15}$
a)

3) $\frac{m}{21} - \frac{5m}{21}$

4) $\frac{d}{6} + \frac{2d}{9}$

5) $\frac{3a}{2} - \frac{a}{6}$

6) $\frac{-x}{8} + \frac{x}{4}$

7) $\frac{5c}{3} - \frac{10c}{15}$

8) $\frac{7}{3a} + \frac{5}{3a}$

WEEK 2.

Day 2.1 - Find the product.

1) $\frac{2}{3} \cdot \frac{7}{8}$

2) $\frac{-5}{12} \cdot \frac{3}{10}$

3) $\frac{3}{4} \cdot (-12)$

4) $\frac{-4}{15} \cdot \frac{5}{8}$

5) $4\frac{1}{8} \cdot 1\frac{2}{3}$

Day 2.2 - Find the quotient.

1) $\frac{7}{12} \div \frac{2}{3}$

2) $\frac{-4}{9} \div \frac{-8}{11}$

3) $\frac{15}{16} \div \frac{5}{24}$

4) $\frac{7}{8} \div \frac{3}{10}$

5) $\frac{-4}{21} \div \frac{-12}{28}$

Day 2.3 - Evaluate the expression when $m = 7$, $n = 9$, and $q = 10$.

1) $n \cdot q$

4) $29 - m$

2) $\frac{18}{n}$

5) $16 \cdot q$

3) $m + q$

6) $m + n + q$

Day 2.4 - Evaluate the expression using the order of operations.

1) $8 \div 2 (2 + 2)$

2) $9 (5 - 3)^3$

3) $100 \cdot 2 \div 40 - 16 \div 4$

4) $550 - (11^2 - 7^2 \cdot 2)^2$

WEEK 3.

Day 3.1 - Find the sum.

1) $-14 + 30$

2) $-9 + 12 + (-4)$

3) $-21 + (-34)$

4) $-22 + (-13) + 6$

Day 3.2 - Find the difference.

1) $13 - (-8)$

2) $4 - (-20)$

3) $-2 - (-24)$

4) $-21 - (-6)$

Day 3.3 - Solve inequalities by adding or subtracting and graph them.

1) $p + 6 < 12$

2) $z - 2 \geq -11$

3) $w + 3 \geq 4$

4) $a - 3 > 2$

5) $-5 + x \leq -20$

6) $-12 + q > 39$

Day 3.4 - Solve inequalities by multiplying or dividing and graph them.

1) $3b > 27$

2) $\frac{k}{3} > 6$

3) $5f > -40$

4) $\frac{b}{-2} \geq 8$

5) $9s > -18$

6) $\frac{w}{4} > 2$

WEEK 4.

Day 4.1 - Solve each multi-step inequalities and graph them.

1) $160 + 4f < 500$

2) $m < 3m + 8$

3) $7 + 2t < 21$

4) $8x > 7x + 6$

5) $12 > 3x - 6$

6) $5t + 1 < -2t + 15$

Day 4.2 - Solve each compound inequalities and graph.

1) $4 \leq x + 2 \leq 8$

2) $n + 2 < 3 \text{ OR } n + 3 > 7$

3) $-3 < x + 2 < 7$

4) $x - 1 < -1 \text{ OR } x - 5 > -1$

5) $2 < x + 2 < 5$

Day 4.3 - Give the domain and range of each relation.

1) $\{(2, 3), (-1, 5), (0, -1), (3, 5), (5, 0)\}$

Domain:

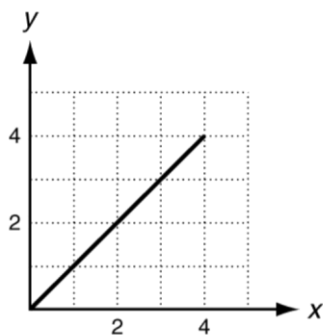
Range:

2) $\{(5, 1), (4, 2), (3, 3), (2, 4), (1, 5)\}$

Domain:

Range:

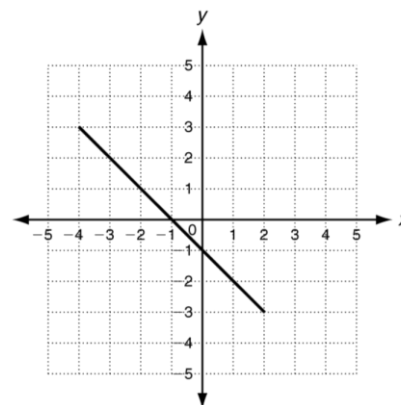
- 3) Use the graph to determine the domain and range:



Domain:

Range:

- 4) Use the graph to determine the domain and range:



Domain:

Range:

Day 4.4 - Evaluate each function for the given input values.

1) For $f(x) = x - 5$, find $f(x)$ when $x = 0$ and when $x = 3$.

2) For $f(x) = x^2 + 6$, find $f(x)$ when $x = 1$ and when $x = 2$.

3) For $f(x) = \frac{2}{3}x + 3$, find $f(x)$ when $x = 9$ and when $x = -3$.

4) For $f(x) = 3x + 1$, find $f(x)$ when $x = -2$ and when $x = 7$.

WEEK 5.

Day 5.1 - Find the x- and y-intercepts

1) $-3x + 5y = 30$

2) $4x + 2y = 16$

3) $y - x = -1$

4) $5x + 3y = 15$

5) $-2x = 9y - 18$

6) $x - 3y = -1$

Day 5.2 - Find the slope of each line.

The Slope Formula is: $m = \frac{y_2 - y_1}{x_2 - x_1}$

1) (1, 2) and (7, 7)

2) (3, 4) and (-5, 0)

3) (5, -2) and (5, 8)

4) (2, -5) and (5, -2)

5) $x - y = 5$

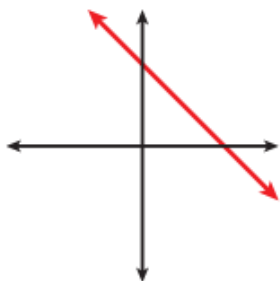
6) $3x + y = 9$

7) $y = 5x + 10$

8) $2x + 5y = 10$

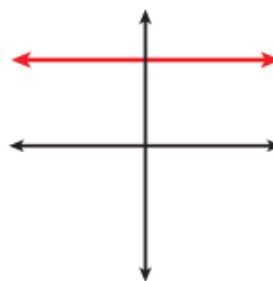
Day 5.3- Tell whether the slope of each line is positive, negative, zero, or undefined.

1)



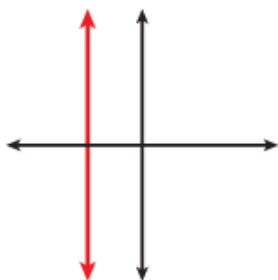
- a. positive
- b. negative
- c. zero
- d. undefined

2)



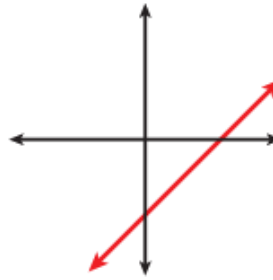
- a. positive
- b. negative
- c. zero
- d. undefined

3)



- a. positive
- b. negative
- c. zero
- d. undefined

4)



- a. positive
- b. negative
- c. zero
- d. undefined

Day 5.4- Write the equation that describes each line in slope-intercept form.

- 1) Slope: -7,
Y-intercept = 6

- 2) Slope: 4
Y-intercept = -3

- 3) Slope: 8
Y-intercept = 2

- 4) Slope: 0
Y-intercept = -3

- 5) Slope: 2
Point (3, 4) is on the line.

- 6) Slope: 8
Point (-3, 1) is on the line.

WEEK 6.

Day 6.1 - Each pair of points is on a line. Find the intercepts.

1) (5, 2) and (7, 4)

x-intercept =

y-intercept =

2) (2, 9) and (-4, -9)

x-intercept =

y-intercept =

Day 6.2 - Solve each system by Substitution.

1.
$$\begin{cases} y = x + 3 \\ y = 2x + 12 \end{cases}$$

2.
$$\begin{cases} x - 3y = 3 \\ 2x = 3y \end{cases}$$

3.
$$\begin{cases} x + y = -1 \\ y = -2x + 3 \end{cases}$$

4.
$$\begin{cases} y = -x \\ y = -2x - 5 \end{cases}$$

Day 6.3 - Solve each system by Elimination.

1.
$$\begin{cases} x + 3y = 15 \\ 2x - 3y = -6 \end{cases}$$

2.
$$\begin{cases} x + y = 12 \\ x - y = 2 \end{cases}$$

3.
$$\begin{cases} 3x - y = 7 \\ 2x + y = 3 \end{cases}$$

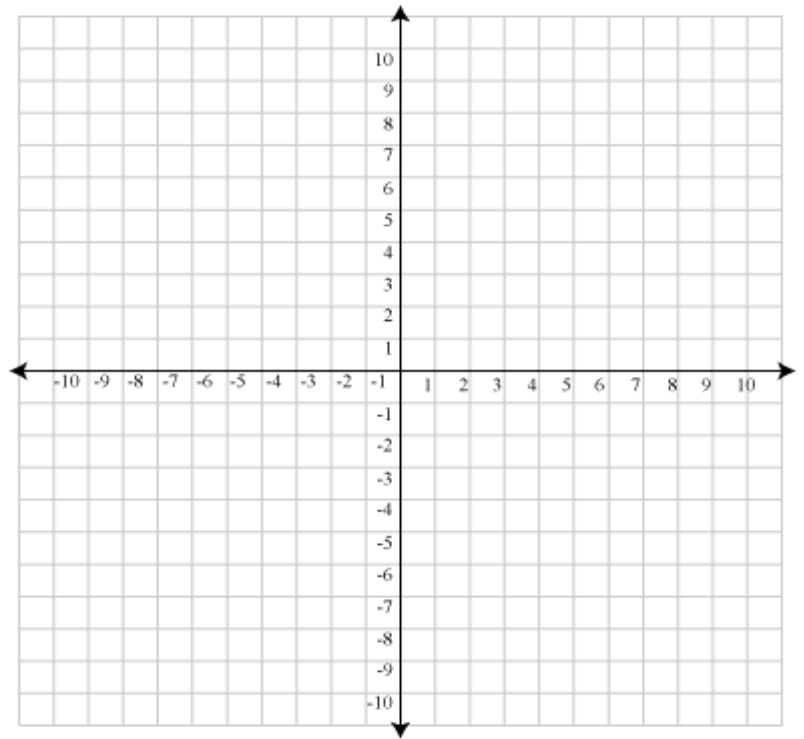
4.
$$\begin{cases} -x + y = 5 \\ x - 5y = -9 \end{cases}$$

5.
$$\begin{cases} 4x + y = 0 \\ x + y = -3 \end{cases}$$

6.
$$\begin{cases} -2x + 5y = -1 \\ 3x + 2y = 11 \end{cases}$$

Day 6.4 - Solve each system by Graphing.

1.
$$\begin{cases} y = -2x + 5 \\ y = 4x - 1 \end{cases}$$



WEEK 7.

Day 7.1 - Evaluate each expression and simplify.

1) $4m^0$

2) $a^3 \cdot a^{-6} \cdot a^{-2}$

3) $2x^0y^{-4}$

4) $(3x^4)^3$

5) $(m^3n^2)^5$

6) $(cd^6)^0 \cdot (c^5d^2)^2$

Day 7.2 - Evaluate each expression and simplify.

1) $\frac{c^4}{c^{-2}}$

2) $\frac{2s^5}{s^2}$

3) $\frac{s^{-3}}{t^{-5}}$

4) $\frac{4fg^{-5}}{12h^{-3}}$

5) $\frac{2x^{-3}y^{-2}}{z^4}$

6) $\left(\frac{4p^3}{2pq^4}\right)^2$

Day 7.3 - Find the product of the following polynomials and simplify.

1) $(2r)(4r)$

2) $(3a^3b)(2ab)$

3) $2x(x^2 - 4x + 6)$

4) $-3ab(ab - 2a^2b + 5a)$

Day 7.4 - Find the product of the following polynomials and simplify.

1) $(2q + 6)(4q + 5)$

2) $(5g - 8)(4g - 1)$

3) $(-3y + 1)(4y^2 - y - 7)$

4) $(p^2 + 3p)(9p^2 - 6p - 5)$

WEEK 8.

Day 8.1 - Find the product of the following polynomials and simplify.

1) $(2x + 4)^2$

2) $(3a^2 - b)^2$

3) $(5x + 8y)^2$

4) $(x + 9)(x - 9)$

Day 8.2 - Factor each polynomial completely.

1) $8c^2 + 7c$

2) $15x^5 - 18x$

3) $-8n^4 - 20n^2 - 28n$

4) $6m^6 + 18m^4 - 24m$

5) $-5k^2 - 15k - 25$

6) $2x^4 + 2x^3 - 20x^2 - 46x$

Day 8.3 - Factor out a common binomial factor.

1) $3m(m + 5) + 4(m + 5)$

2) $16b(b - 3) + (b - 3)$

3) $-9a(5a - b) - 5(5a - b)$

4) $2x(x^2 + 1) - (x^2 + 1)$

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