

To Cleveland IB Math SL 1-2 prospective students:

The Cleveland math department wants you to have a positive, successful experience next year. In order for that to happen, you need to be prepared with prerequisite Algebra and Geometry skills. When you return to school in the fall, your math teacher will give you a test composed of topics from this packet. This packet is designed to help you decide if SL 1-2 is the right math class for you. It takes a level of dedication and a strong work ethic to be successful in SL 1-2. We look forward to next year and hope to see you ready and excited to learn! .. CHS math dept.

- A) Write the equation of the line in slope-intercept form.
- 1) The line through points $(-5, -11)$ and $(15, 5)$
 - 2) The line through $(10, 2)$ and perpendicular to $y = -(8/3)x + 10$
 - 3) The line through $(8, -1)$ and parallel to the line through $(11, 6)$ and $(1, 18)$
 - 4) The horizontal line through $(-1, 11)$
- B) Find the midpoint between the given points. Find the distance between the given points.
- 1) $(-4, 2)$ and $(12, 9)$
 - 2) $(-3, 10)$ and $(5, -1)$
- C) Simplify or Solve the given rational expression or rational equation.
- 1) $\frac{x^2-9}{2x^2-x-1} \div \frac{4x^2-8x-60}{5x^2-30x+25}$
 - 2) $\frac{4}{k^2-8k+12} = \frac{k}{k-2} + \frac{1}{k-6}$
- D) Factor.
- 1) $x^2 - 8x - 20$
 - 2) $4x^2 + 18x$
 - 3) $4x^2 - 81$
 - 4) $5x^2 + 7x - 6$
 - 5) $x^2 - 7x + 2x - 14$
- E) Find the product.
- 1) $(3w + 4)(2w - 11)$
 - 2) $(4x - 5)^2$
 - 3) $(4x - 5)(2x^2 + x - 10)$
- F) Simplify.
- 1) $(-3x^2w^5)^4$
 - 2) $\frac{18xy^3}{30x^4y}$
 - 3) $\frac{((-10h^4k^3)^2)}{60h^3k^8}$
- G) Simplify. (no calculator)
- 1) $\frac{3}{8} + \frac{1}{10}$
 - 2) $\frac{5}{6} - \frac{3}{10}$
 - 3) $\frac{8}{11} \div \frac{3}{5}$
 - 4) $\frac{\frac{3}{16}}{\frac{5}{6}}$
- H) Solve using the quadratic formula.
- 1) $10x^2 + 10x + 2 = x$
 - 2) $2x^2 - 9x + 4 = 0$
 - 3) $3x^2 - 5x = -4$
- I) Solve for all missing sides and angles.
- 1) A right triangle HJK with angle $H=90^\circ$, angle $J=37^\circ$, side $j=5$ cm.
 - 2) An obtuse triangle ABC with angle $A=120^\circ$, side $a=10''$ and side $b=6''$.

J. Solve.

1.) $-18 - 6k = 6(1 + 3k)$

2.) $-1(1 + 7x) - 6(-7 - x) = 36$

3.) $60 - 4m + 2m = -2(m - 20)$

4.) $\frac{1}{4}(12x + 4) - 14 = -\frac{1}{2}(8x - 16)$

5.) $38 = \frac{-19}{20}x$

6.) $\frac{1}{4}x - \frac{3}{4}x = \frac{1}{2}$

7.) $\frac{7}{2}(x - 3) = \frac{4}{5}(x + 10)$

8.) $\frac{g-9}{5} = \frac{g+5}{8}$

9.) $\frac{x+2}{3} = \frac{8}{x}$

10.) $\frac{2m-4}{5} = \frac{6}{m}$

11.) $|2x + 3| = 7$

12.) $15 - 2|x + 1| = 3$

K. Solve each inequality. Represent the solution set on a number line.

1.) $3 < -5n - 2n$

2.) $6x + 2 + 6x < 14$

3.) $-138 \geq -6(6n - 7)$

4.) $-2(5 + 6g) < 6(8 - 2g)$

L. Solve each system.

1.) $\begin{cases} 7x + 2y = 24 \\ 8x + 2y = 30 \end{cases}$

2.) $\begin{cases} -4x + 9y = 9 \\ x = 3y - 6 \end{cases}$

3.) $\begin{cases} 2x - 6 = -8y \\ 15 - 5x - 20y = 0 \end{cases}$

4.) $\begin{cases} 6x + 5y = -\frac{7}{4} \\ -3x - 2y = 1 \end{cases}$

M. Given $f(x) = 4x$ and $g(x) = 2x^2 - 5$ and $h(x) = \sqrt{x + 11}$, calculate the following:

1.) $f(-2)$

2.) $g(-3)$

3.) $h(-2)$

4.) $f(4) - g(2) + h(5)$

5.) x if $f(x) = 10$

6.) x if $g(x) = 27$

7.) x if $h(x) = 5$

8.) $f(g(x))$

9.) $g(f(x))$

N. Exponential Functions

- 1.) A \$16,500 car depreciates at an annual rate of 20%. What will the car be worth after 36 months?
- 2.) A bacteria colony of 500 grows at a rate of 7% per day. What will the bacteria population be after 6 days?
- 3.) An investment of \$3000 will pay 5.5% interest, compounded monthly. What will the investment be worth in 10 years?
- 4.) Write an equation to represent the table below:

x	y
1	6
2	4
3	$\frac{8}{3}$
4	$\frac{16}{9}$

O. Simplify. Express any restrictions upon the domain.

1.) $\frac{10x+25}{2x^2-x-15}$

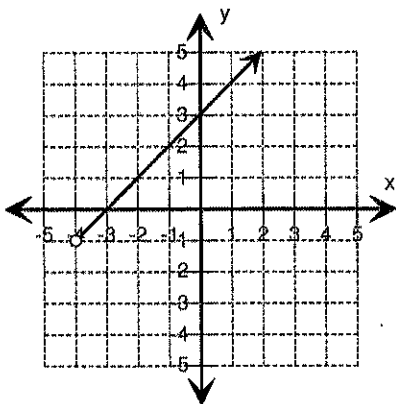
2.) $\frac{x^2-2x-35}{6x^2+30x}$

3.) $\frac{128x^7y^4}{4xy^3}$

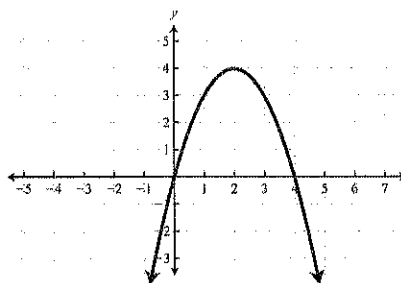
4.) $\frac{(x+2)^2(x-4)}{(x+2)(x-4)}$

P. Express the Domain and Range of the following.

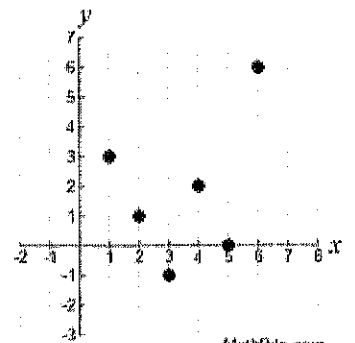
1.)



2.)



3.)



Answer Key:

- A) 1) $y=4/5x-7$ 2) $y=3/8x-7/4$ 3) $y=-6/5x+43/5$ 4) $y=11$
- B) 1) midpt=(4,5.5) $d\approx 17.46$ 2) midpt=(1,4.5) $d\approx 13.6$
- C) 1) $\frac{5x-15}{8x+4}$ 2) $k=1$ ($k=6$ is extraneous)
- D) 1) $(x-10)(x+2)$ 2) $2x(2x+9)$ 3) $(2x+9)(2x-9)$ 4) $(5x-3)(x+2)$ 5) $(x+2)(x-7)$
- E) 1) $6w^2-25w-44$ 2) $16x^2-40x+25$ 3) $8x^3-6x^2-45x+50$
- F) 1) $81x^8w^{20}$ 2) $\frac{3y^2}{5x^3}$ 3) $\frac{5h^5}{3k^2}$
- G) 1) $\frac{19}{40}$ 2) $\frac{8}{15}$ 3) $\frac{40}{33}$ 4) $\frac{9}{40}$
- H) 1) $x=\frac{-1\pm\sqrt{5}}{2}$ 2) $x=4, x=1/2$ 3) $x=(5\pm i\sqrt{23})/6$
- I) 1) $k=4$ cm. $h=\sqrt{41}$ cm. Angle $K=53^\circ$ 2) $c\approx 5.54$ in. Angle $C\approx 28.7^\circ$ Angle $B\approx 31.3^\circ$
- J) 1.) $k=1$ 2.) $x=5$ 3.) No solution 4.) $x=3$ 5.) $x=-40$ 6.) $x=-1$
7.) $x=185/27$ 8.) $g=97/3$ 9.) $x=-6, 4$ 10.) $m=5, -3$ 11.) $x=2, -5$ 12.) $x=5, -7$
- K) 1.) $n\leftarrow\frac{3}{7}$ 2.) $x<1$ 3.) $n\geq 5$ 4.) All Real Numbers
- L) 1.) (6, -9) 2.) (9, 5) 3.) All Real Numbers 4.) $(-1/2, 1/4)$
- M) 1.) -8 2.) 13 3.) 3 4.) 17 5.) $x=5/2$ 6.) $x=4$ or -4 7.) $x=14$
8.) $8x^2-20$ 9.) $32x^2-5$
- N) 1.) \$8450 2.) 750 bacteria 3.) \$5193.23 4.) $y=9\left(\frac{2}{3}\right)^x$
- O) 1.) $\frac{5}{x-3}, x\neq 3$ 2.) $\frac{x-7}{6x}, x\neq 0$ 3.) $32x^6y$ 4.) $x+2$
- P) 1.) Domain: $x>-4$ Range: $y>-1$ 2.) Domain: All Real Numbers Range: $y\leq 4$
3.) Domain: $\{1, 2, 3, 4, 5, 6\}$ Range: $\{-1, 0, 1, 2, 3, 6\}$