Math 4c. Class work 16.

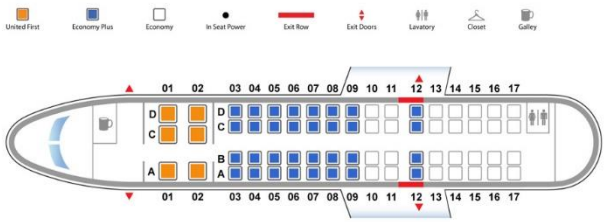
Algebra.

$$\begin{array}{r|l} 12.5 & \\ 4 & 50.0 \\ -4 & \\ \hline 10 & \\ -8 & \\ \hline 20 & \\ -20 & \\ \hline 0 & \end{array} \qquad \begin{array}{r|l} 4.92 & \\ 5 & 24.6 \\ -0 & \\ \hline 24 & \\ -20 & \\ \hline 46 & \\ -45 & \\ \hline 10 & \\ -10 & \\ \hline 0 & \end{array} \qquad \begin{array}{r|l} 35.2 & \\ 23 & 809.60 \\ -69 & \\ \hline 119 & \\ -115 & \\ \hline 46 & \\ -46 & \\ \hline 0 & \end{array}$$

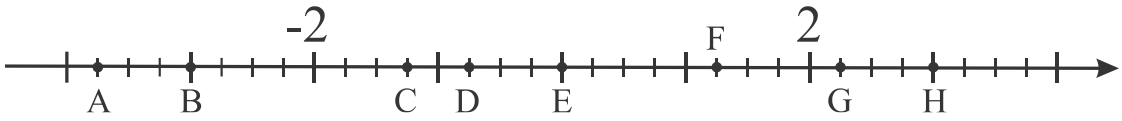
$$80.96 : 2.3 = 809.6 : 23 = \frac{80.96 \cdot 10}{2.3 \cdot 10}$$

Positive and negative numbers. Absolute value of a number.

Coordinates are a set of values that show an exact position. How many values do we need to show the exact position of the point on the number line? How many values do we need to find our place in a theater? In a plane? What we can use as values?



Find the coordinates of points A, B, C, D, E, F, G, and H on the number line below:



Mark the points A(0), B(1), C$\left(-1\frac{1}{2}\right)$, D(5), E$(-5)$, F$(-3)$, G(3)

Is there anything in common between points F and G, D and E?

$$\begin{cases} |a| = a, & if\ a \geq 0 \\ |a| = -a, & if\ a < 0 \end{cases}$$

$|5| =$ $\quad |-5| =$ $\quad |10| =$ $\quad |-10| =$

What does absolute value of a number represent?

Does a fraction have an absolute value?

$$\left|\frac{1}{2}\right| = \qquad\qquad \left|-\frac{1}{2}\right| =$$

Can we solve the following equation? How many solutions does it have.

$$|x| = 5$$

To solve an equation means to find all possible values which will give us a true statement when put into the equation instead of a variable.

$|x| = 3$ $\qquad$ $|y| = 10$ $\qquad$ $|z| = -2$

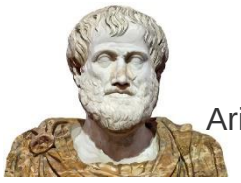
Now, what about

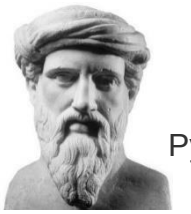
$|x + 3| = 10$ $\qquad$ $|z - 5.2| = 11.4$ $\qquad$ $|5.4x - 0.5| = 8.1$

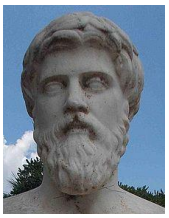
1. Compare (replace … with >, <, or =) if possible, if it is known that a and b are positive numbers and x and y are negative numbers:

$0 \ldots x$	$a \ldots 0$	$-b \ldots 0$	$0 \ldots -x$
$a \ldots x$	$y \ldots b$	$-y \ldots x$	$-a \ldots b$
$\lvert x\rvert \ldots x$	$-\lvert y\rvert \ldots y$	$a \ldots \lvert a\rvert$	$\lvert b\rvert \ldots \lvert -b\rvert$
$\lvert x\rvert \ldots a$	$\lvert x\rvert \ldots -x$	$\lvert x\rvert \ldots -\lvert y\rvert$	$a \ldots \lvert -b\rvert$

2. Ancient Greek scientist Aristotle was born in 384 and died in 322. Another Greek scientist Pythagoras was born in 570 and dies in year 495. Ancient Greek historian Plutarch was born in 46 and died in 120. How among them was born earlier? For how long did they live?


Aristotle


Pythagoras


Plutarch

3. Compute:

4.

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

2) $\frac{6}{7}\cdot\frac{7}{8}\cdot\frac{8}{9}\cdot\frac{9}{10}\cdot\frac{10}{11}$;

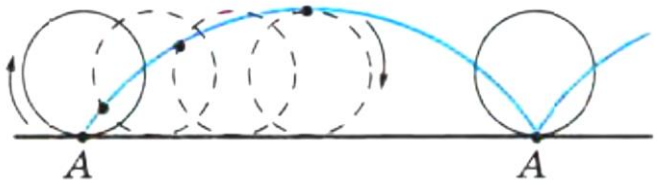
3) $\frac{1}{2}\cdot\frac{2}{3}\cdot\ldots\cdot\frac{23}{24}\cdot\frac{24}{25}$;

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

5) $\left(1+\frac{1}{4}\right)\cdot\left(1+\frac{1}{5}\right)\cdot\left(1+\frac{1}{6}\right)\cdot\left(1+\frac{1}{7}\right)\cdot\left(1+\frac{1}{8}\right)$;

6) $\left(1-\frac{1}{2}\right)\cdot\left(1-\frac{1}{3}\right)\cdot\left(1-\frac{1}{4}\right)\cdot\ldots\cdot\left(1-\frac{1}{99}\right)\cdot\left(1-\frac{1}{100}\right)$.

Geometry.



Circle is running along the line. At a starting time point A was the point of contact of the circle and the line. The curve which point A will trace is called cicloide.

What line the center of the circle will trace?

Imagine the “square wheel” – a square which is staying on a road. Draw a line traced by the point A (vertex) in a process of “rolling”? The diagonal intersection?