

Radicals and Rational numbers

1) Circle the numbers below that represent IRRATIONAL numbers.

$\frac{5}{9}$

$\frac{5}{\sqrt{9}}$

$\sqrt{.0036}$

$\frac{\pi}{6}$

$0.\overline{94}$

$-5\sqrt[3]{32}$

2) Show that the numbers below are RATIONAL by converting to $\frac{p}{q}$ where p and q are integers.

a. 0.781

b. $0.\overline{44}$

c. $4.\overline{6231}$

3) Simplify the expressions into their simplest radical form. Show your work. Do not use a calculator.

a. $-8\sqrt{49}$

c. $\sqrt{72}$

b. $\frac{\sqrt{12}}{\sqrt{18}}$

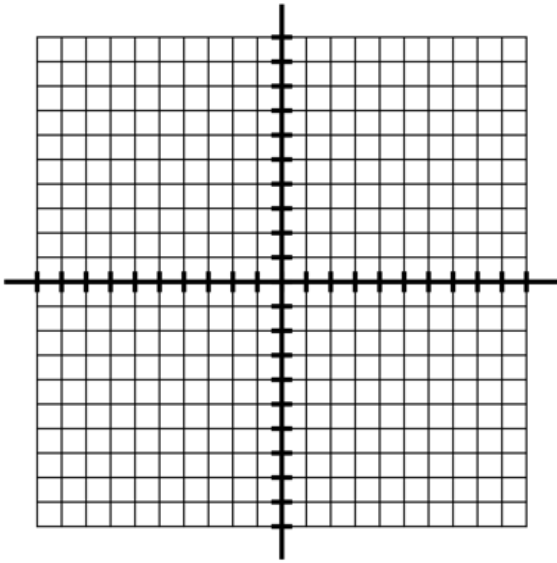
d. $\sqrt{768}$

e. $3\sqrt{16000}$

MATH 1: Accelerated

Lines, Midpoints and Distances

4) A line segment \overline{AB} has endpoints with coordinates $A(-3,2)$ and $B(3,11)$.



a) Calculate the slope of the segment.

b) Calculate the midpoint of the segment.

c) Calculate the length of the segment.

d) Find a point D that splits the \overline{AB} into two parts with lengths in a ratio of 1:2

5) Write the equation of the line that is parallel to the line $x = 9$ and passes through the point $(1, 7)$.

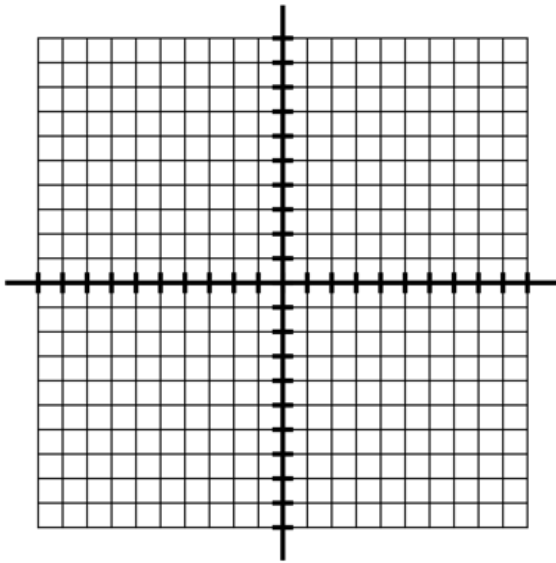
6) Write the equation of the line that is parallel to $y = \frac{-1}{3}x + 4$ and passes through the point $(9, -5)$.

7) Write the equation of the line that is perpendicular to $x - 3y = 12$ and passes through point $(6, 5)$.

MATH 1: Accelerated

8) In $\triangle ABC$, $A = (0, -4)$, $B = (3, 6)$, and $C = (-4, 2)$.

a. Graph the points on the grid below.

b. Find the coordinate of midpoint of \overline{AC} .c. Write the length of \overline{BC} .d. Write the equation of the line containing the **height** of $\triangle ABC$ from point C to side to \overline{AB} .e. Determine if $\triangle ABC$ is a right triangle. Explain your answer clearly with mathematical justification. A graph is NOT sufficient justification.f. Justify that the line segment connecting the midpoints of \overline{AC} and \overline{CB} is parallel to side \overline{AB} .

Transformations:

9) Circle which transformations below are **rigid transformations**. (In other words, circle ALL that will produce an image **congruent to** the preimage):

- a) Translate the image up 4 units and right 6 units.
- b) $(x, y) \rightarrow (8x, -y + 2)$
- c) $(x, y) \rightarrow (-y, 5x)$
- d) $(x, y) \rightarrow (x - 4, 2(y + 3))$
- e) $(x, y) \rightarrow (y - 2, x + 1)$
- f) Rotate 180 degrees about the point $(2, 3)$.

10) Given $P = (-6, 2)$, identify the coordinates of the image P' when the following transformations are performed:

a) $(x, y) \rightarrow (x + 14, x - 9)$	b) $(x, y) \rightarrow (2x, -5y)$
c) (x, y) is rotated 90 degrees.	d) (x, y) is reflected over the y - axis
e) (x, y) is rotated 180 degrees.	f) (x, y) is reflected over the line $y = -x$
g) (x, y) is reflected across the line $y = 4$	h) (x, y) is rotated 90 degrees about the origin then reflected across $y = x$
i) $(x, y) \rightarrow (y - 2, x + 1)$ and then rotated 270 degrees.	j) $(x, y) \rightarrow (y - 2, x + 1)$ and then rotated 270 degrees.
k) (x, y) is reflected over the x - axis.	

11) Write a rule for transforming the point (x, y) under the conditions given below.

- a) Translate right 2 and up 3. Then reflect in the x -axis.
- b) Rotate 90 degrees around the origin and then reflect in the line $y = -x$
- c) Rotate around the point $(-4, 5)$.
- d) Reflect over the line $y = -4$

Quadrilaterals:**For #12-14, circle the appropriate answers.**

12) Which TWO statements are true:

- a. All rectangles are always squares.
- b. All squares are always rhombuses.
- c. All trapezoids are parallelograms.
- d. All rectangles are always parallelograms.

13) Choose the best answer:

If I draw the sides of a figure and consecutively the sides measure 9 inches, 5 inches, 9 inches and 5 inches without any other information you can determine that I've drawn a

- a. Rectangle.
- b. Rhombus.
- c. Parallelogram.
- d. Square.

14) A figure with four sides and perpendicular diagonals could be a

- a. Rhombus or square.
- b. Rectangle or square.
- c. Trapezoid or rhombus.
- d. Rectangle or trapezoid.

15) A quadrilateral that has diagonals that bisect each other could NOT be a

- a. Rectangle,
- b. Rhombus.
- c. Parallelogram.
- d. Trapezoid.

Write the appropriate answer in the space provided.

16) Identify which quadrilateral has ALL of the properties listed:

- a. Opposite sides are congruent.

- b. Opposite sides are parallel

17) Name the quadrilateral that has at least two parallel sides.

18) Name the quadrilateral that has ALL the properties listed below:

- a) Opposite sides are congruent.

- b) Opposite sides are parallel

- c) At least one angle is a right angle.

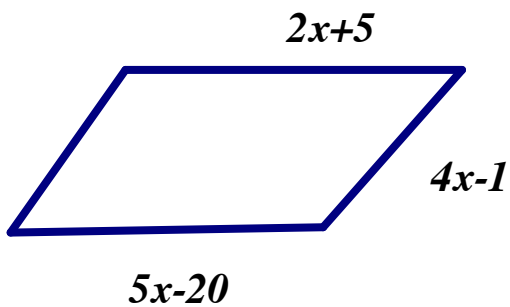
19) Name the quadrilaterals with diagonals that always bisect each other.

20) Name the quadrilaterals that have perpendicular diagonals.

21) Name the quadrilaterals that have congruent diagonals.

22) The perimeter of a square is 24. Sketch a figure and then find the length of the diagonal of the square and write it in simplest radical form.

23) The opposite sides of a parallelogram are represented by $2x + 10$ and $5x - 20$. Find the length of the side represented by $4x - 1$.



24) Given quadrilateral ABCD, write a plan for **how** you would prove the following: *[In your description explain that whether you will use slope, midpoints and distances...]*

A. How would you prove ABCD is a Rectangle?

B. How would you prove ABCD is a Rhombus?

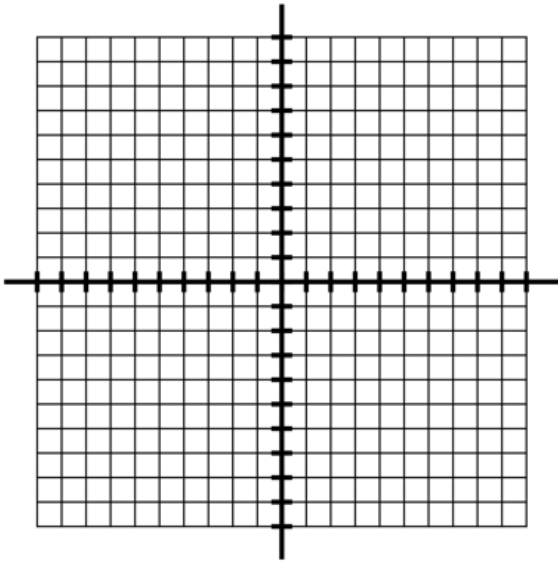
C. How would you prove ABCD is a Square?

D. How would you prove ABCD is an Isosceles Trapezoid?

E. How would you prove ABCD is a Kite?

For the following problems you must write a coordinate geometry proof. This means that you must show calculations for slopes, distances, midpoints, etc. and use these calculations/measurements to justify your argument. A DRAWING IS NOT A SUFFICIENT JUSTIFICATION.

- 25) Justify that the points $A(2,3)$, $B(7,10)$, $C(9,4)$, and $D(4,-3)$ form a parallelogram that is NOT a rectangle.



- 26) Given points $A(0,0)$ and $B(1,3)$, find two points C and D so that $ABCD$ is a kite but not a rhombus. Justify your answer with mathematical reasoning.

