

Junior High Math League
Sample Questions by Meet and Topic
Meet 1

Aug 2-7:22 PM

Meet 1

- 1.1 Common Factors and Multiples
- 1.2 Evaluating Expressions
- 1.3 Manipulating Fractions and Decimals
- 1.4 Understanding Ratios
- 1.5 Translating Verbal Statements
- 1.6 Area and Perimeter of 2-D Shapes
- 1.7 The Coordinate Plane
- 1.8 Measures of Central Tendency
- 1.9 Logic Problems

Aug 2-7:23 PM

1.1 Common Factors and Multiples

_____ 1. List all prime numbers between 160 and 170.

Oct 22-9:49 PM

1.1 Common Factors and Multiples

_____ 4. Which integers between 50 and 60 are prime?

Oct 22-9:51 PM

1.1 Common Factors and Multiples

_____2. What is the greatest common factor between 78 and 84?

Oct 22-9:56 PM

1.1 Common Factors and Multiples

_____5. How many factors does 180 have?

Oct 22-9:55 PM

1.1 Common Factors and Multiples

_____8. Factor 2100 into primes of the appropriate power.

Oct 22-9:56 PM

1.1 Common Factors and Multiples

_____4. If a number is divisible by 12, it must also be divisible by what other integers, other than 1 and itself?

Oct 22-9:57 PM

1.1 Common Factors and Multiples

_____ 6. Factor 456 into primes of the appropriate power.

Oct 22-9:58 PM

1.2 Evaluating Expressions

_____ 1. How many integers are between 2012 and 3000, exclusive (not including 2012 or 3000)?

Oct 22-10:14 PM

1.2 Evaluating Expressions

_____ 9. Simplify: $7 - 2(-5) + 4(3 + -2)$.

Oct 30-7:29 AM

1.2 Evaluating Expressions

_____ 3. Simplify: $\frac{-9 + 5}{3 - 4 - -5}$.

Oct 30-7:30 AM

1.2 Evaluating Expressions

- _____6. Mary paid \$200 to have a booth at the fair. She spent \$46 on supplies and paid an assistant \$50. She took in \$550. What was her profit?

Oct 30-7:33 AM

1.2 Evaluating Expressions

- _____7. At the fair, Youa bought two drawings at \$20 each, coffee for \$2, lunch for \$12 and a vase for \$15. How much did she spend?

Oct 30-7:33 AM

1.2 Evaluating Expressions

_____ 3. $4! = ?$

Nov 12-9:49 PM

1.2 Evaluating Expressions

_____ 3. Write 5040 as one factorial.

Nov 12-9:57 PM

1.2 Evaluating Expressions

_____ 2. Solve for r if $\frac{8!}{r!(8-r)!} = 56$.

Nov 12-10:00 PM

1.3 Manipulating Fractions and Decimals

_____ 3. Write as a decimal: $\frac{2}{5} + \frac{3}{4} \div 10 = ?$

Oct 22-7:40 AM

1.3 Manipulating Fractions and Decimals

_____ 1. Write 427.6789 to the nearest hundredth.

Oct 22-7:46 AM

1.3 Manipulating Fractions and Decimals

_____ 4. When divided, $1/23$ has a repetend (the repeating part of the decimal) of 22 digits. What are the last two digits of the repetend?

Oct 22-7:46 AM

1.3 Manipulating Fractions and Decimals

- _____2. On a fishing trip the husband caught 52 walleye, 20 northern, and 23 sauger. The wife caught 70 walleye, 15 northern, and 5 sauger. What fraction of the fish caught were sauger caught by the husband?

Oct 22-7:54 AM

1.3 Manipulating Fractions and Decimals

- _____9. What fraction of a circle does the hour hand of a clock move through in one minute?

Oct 22-8:02 AM

1.3 Manipulating Fractions and Decimals

- _____ 2. On a fishing trip to Canada, a couple caught 163 fish. They caught 110 walleye, 5 northern pike, 6 rock bass, and the rest were perch. They brought home 10 perch. What fraction of the perch caught were brought home (in a reduced fraction)?

Oct 22-7:59 AM

1.3 Manipulating Fractions and Decimals

- _____ 5. Simplify:

$$\frac{4 - \sqrt{12} - 3}{\sqrt{5} - 6 + \sqrt{2}}$$

Oct 22-8:01 AM

1.4 Understanding Ratios

- _____ 4. A recipe for orange aide calls for 3 cups of orange liquid concentrate to 5 cups of water. How much orange concentrate would you need to make 120 cups of orange aide?

Dec 4-12:03 AM

1.4 Understanding Ratios

- _____ 3. Write 140% as a ratio of two relatively prime numbers.

Dec 4-12:04 AM

1.5 Translating Verbal Statements

_____ 1. Write the equation for two less than a number, n , is ten.

Oct 22-10:14 PM

1.5 Translating Verbal Statements

_____ 3. There are p pencils to be put into b school boxes equally. Write an equation for n , the number of pencils in each box.

Oct 30-7:40 AM

1.5 Translating Verbal Statements

- _____ 2. Write the equation for: The product of a number and one more than the number is the number increased by seven hundred seven. Let the number be n .

Oct 30-7:41 AM

1.6 Area and Perimeter of 2-D Shapes

- _____ 3. What is the perimeter of a rectangle twice as long as it is wide if the long side is 100 inches?

Dec 3-11:54 PM

1.6 Area and Perimeter of 2-D Shapes

- _____ 2. If an eight inch pie is cut in to eight equal pieces, what is the perimeter of one piece? Answer in terms of π .



Dec 3-11:55 PM

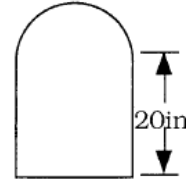
1.6 Area and Perimeter of 2-D Shapes

- _____ 1. If the radius of a circle is exactly $\frac{5}{\pi}$ cm, what is the circumference?

Dec 3-11:56 PM

1.6 Area and Perimeter of 2-D Shapes

- _____ 3. A 16 in. by 20 in. rectangular window has a semicircle on one of the shorter ends. What is the perimeter in terms of π ?



Dec 3-11:57 PM

1.6 Area and Perimeter of 2-D Shapes

- _____ 1. What time is it, to the nearest minute, if the angle between the hands on a clock is 35° , the hour hand is between 4 and 5, and the minute hand is between 5 and 6?

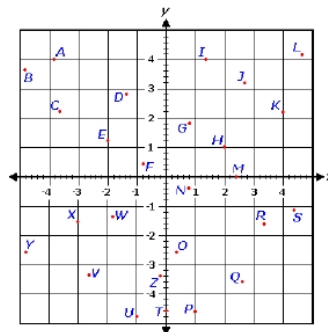
Dec 3-11:59 PM

1.7 The Coordinate Plane

This is a new topic involving points on a coordinate plane. Sample questions provided are based on the location of points on a coordinate plane, in (x,y) ordered pair sequence.

Dec 3-11:59 PM

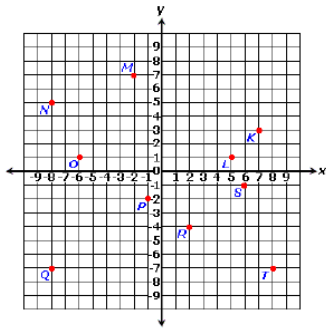
1.7 The Coordinate Plane



What are the coordinates of point B?

Sep 24-7:12 PM

1.7 The Coordinate Plane



Which point is at (-8,-7)?

Sep 24-7:14 PM

1.8 Measures of Central Tendency

_____ 4. If scores of 60, a , 75, a , a , 90 average to 80, what is a ?

Oct 22-7:39 AM

1.8 Measures of Central Tendency

- a _____ 2. Given: 40, 35, 7, 40, 21, 18, 27.
a. What is the mode?
b _____ b. What is the median

Feb 2-7:43 PM

1.8 Measures of Central Tendency

- _____ 4. If the mean, median, mode, and range of a set of data are 45, 45, 41, and 9 respectively, and you add 75 to the data list, which will change the most: mean, median, or mode?

Feb 2-7:43 PM

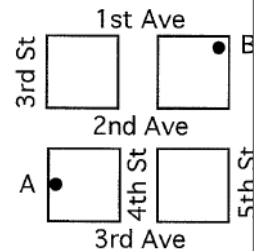
1.8 Measures of Central Tendency

- _____4. Sarah earned scores of 80, 90, and 95 on her first three tests. What does she need to score on her fourth test to average 90?

Feb 2-7:48 PM

1.9 Logic Problems

- _____4. Alice lived on 3rd St, in the middle of the block, on the west side between 2nd Ave. and 3rd Ave., and Beth lived at the southwest corner of the intersection of 5th St. and 1st Ave. How far must Alice walk to get to Beth's house? Alice stays on the side of the road and uses the crosswalks and goes the shortest route. The blocks are 400 feet long, and the streets are 100 feet wide.



Feb 2-7:48 PM

1.9 Logic Problems

- _____ 3. Jenni needed 144 squares $7\frac{1}{2}$ inches on a side to make a quilt. Half were plain fabric, half were flowered fabric. If each roll of fabric is 43 inches wide, what length of plain fabric does she need, to the nearest $\frac{1}{8}$ of a yard

Feb 2-7:48 PM

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- _____ 2. Peter walked on a treadmill for 40 minutes. The treadmill was set at a pace equivalent to 3 miles per hour. How many miles did Peter walk?

Feb 2-7:48 PM

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Aug 2-7:23 PM

1.1 Common Factors and Multiples

_____ 1. List all prime numbers between 160 and 170.

Answers: 163, 167

Eliminate even numbers and numbers ending in 5. Leaves 161, 163, 167, 169.
161 can be divided by 7, 169 can be divided by 13.

Oct 22-9:49 PM

1.1 Common Factors and Multiples

_____ 4. Which integers between 50 and 60 are prime?

Answer: 53, 59

Eliminate even numbers and numbers ending in 5. Leaves 51, 53, 57, 59.
51 and 57 are divisible by 3.

Oct 22-9:51 PM

1.1 Common Factors and Multiples

_____2. What is the greatest common factor between 78 and 84?

Answer: 6

78 84

1*78 1*84

2*39 2*42

3*26 3*28

6*13 4*21

6*14

Oct 22-9:56 PM

1.1 Common Factors and Multiples

_____5. How many factors does 180 have?

Answer: 18

1*180 6*30

2*90 9*20

3*60 10*18

4*45 12*15

5*36 12*15

Oct 22-9:55 PM

1.1 Common Factors and Multiples

_____8. Factor 2100 into primes of the appropriate power.

Answer: $2^2 \cdot 3 \cdot 5^2 \cdot 7$

$$2100 = 2 \cdot 2 \cdot 3 \cdot 5 \cdot 5 \cdot 7$$

Oct 22-9:56 PM

1.1 Common Factors and Multiples

_____4. If a number is divisible by 12, it must also be divisible by what other integers, other than 1 and itself?

Answer: 2, 3, 4, 6

(All are factors of 12)

Oct 22-9:57 PM

1.1 Common Factors and Multiples

_____ 6. Factor 456 into primes of the appropriate power.

Answer: $2^3 \cdot 3 \cdot 19$

$2 \cdot 2 \cdot 2 \cdot 3 \cdot 19$

Oct 22-9:58 PM

1.2 Evaluating Expressions

_____ 1. How many integers are between 2012 and 3000, exclusive (not including 2012 or 3000)?

Answer: 987

$3000 - 2012 = 988 - 1 = 987$

Oct 22-10:14 PM

1.2 Evaluating Expressions

_____ 9. Simplify: $7 - 2(-5) + 4(3 + -2)$.

Answer: 21

$$2(-5) = -10; 4(3 + -2) = 4;$$

$$7 - -10 + 4 = 21$$

Oct 30-7:29 AM

1.2 Evaluating Expressions

_____ 3. Simplify: $\frac{-9 + 5}{3 - 4 - -5}$.

Answer: -1

$$-4 / 4 = -1$$

Oct 30-7:30 AM

1.2 Evaluating Expressions

_____6. Mary paid \$200 to have a booth at the fair. She spent \$46 on supplies and paid an assistant \$50. She took in \$550. What was her profit?

Answer: \$254

$$\$550 - 200 - 46 - 50 = \$254$$

Oct 30-7:33 AM

1.2 Evaluating Expressions

_____7. At the fair, Youa bought two drawings at \$20 each, coffee for \$2, lunch for \$12 and a vase for \$15. How much did she spend?

Answer: \$69

$$2 * 20 = 40 + 2 + 12 + 15 = \$69$$

Oct 30-7:33 AM

1.2 Evaluating Expressions

_____ 3. $4! = ?$

Answer: 24

$$1 * 2 * 3 * 4 = 24$$

Nov 12-9:49 PM

1.2 Evaluating Expressions

_____ 3. Write 5040 as one factorial.

Answer: 7!

$$1 * 2 * 3 * 4 * 5 * 6 * 7 = 5040$$

Nov 12-9:57 PM

1.2 Evaluating Expressions

_____2. Solve for r if $\frac{8!}{r!(8-r)!} = 56$.

Answer: 3 or 5

Consecutive factors of 56 are 7 and 8. Therefore, we need to eliminate factorials from 1 to 6. If $r = 3$, $r!$ eliminates 1 to 3 and $(8-r)! = 5!$ which eliminates 4, 5, and 6 (via $2 \cdot 3$). If $r = 5$, $r!$ eliminates 1 to 5 and $(8-r)! = 3!$ which eliminates 6.

Nov 12-10:00 PM

1.3 Manipulating Fractions and Decimals

_____3. Write as a decimal: $\frac{2}{5} + \frac{3}{4} \div 10 = ?$

Answer = .475

$$.75 / 10 = .075; .4 + .075 = .475$$

Oct 22-7:40 AM

1.3 Manipulating Fractions and Decimals

_____ 1. Write 427.6789 to the nearest hundredth.

Answer: 427.68 or $427 \frac{68}{100}$, simplified as $17/25$

Oct 22-7:46 AM

1.3 Manipulating Fractions and Decimals

_____ 4. When divided, $1/23$ has a repetend (the repeating part of the decimal) of 22 digits. What are the last two digits of the repetend?

Answer: 13

Oct 22-7:46 AM

1.3 Manipulating Fractions and Decimals

- _____2. On a fishing trip the husband caught 52 walleye, 20 northern, and 23 sauger. The wife caught 70 walleye, 15 northern, and 5 sauger. What fraction of the fish caught were sauger caught by the husband?

Answer: $23/185$

Oct 22-7:54 AM

1.3 Manipulating Fractions and Decimals

- _____9. What fraction of a circle does the hour hand of a clock move through in one minute?

Answer: $1/720$

The hour hand moves $1/60$ every 12 minutes so $1/12 * 1/60 = 1/720$

Oct 22-8:02 AM

1.3 Manipulating Fractions and Decimals

- _____ 2. On a fishing trip to Canada, a couple caught 163 fish. They caught 110 walleye, 5 northern pike, 6 rock bass, and the rest were perch. They brought home 10 perch. What fraction of the perch caught were brought home (in a reduced fraction)?

Answer: $10/42 = 5/21$

$$163 - 110 - 5 - 6 = 42$$

Oct 22-7:59 AM

1.3 Manipulating Fractions and Decimals

- _____ 5. Simplify:

$$\frac{4 - 12 - 3}{-5 - 6 + 2}$$

Answer: -1

Oct 22-8:01 AM

1.4 Understanding Ratios

- _____ 4. A recipe for orange aide calls for 3 cups of orange liquid concentrate to 5 cups of water. How much orange concentrate would you need to make 120 cups of orange aide?

Answer: 45

3 cups of orange are needed for every 8 cups. $3/8 = x/120$

Dec 4-12:03 AM

1.4 Understanding Ratios

- _____ 3. Write 140% as a ratio of two relatively prime numbers.

Answer: 7/5

$140\% = 140/100 = 7/5$

Dec 4-12:04 AM

1.5 Translating Verbal Statements

_____ 1. Write the equation for two less than a number, n , is ten.

Answer: $n - 2 = 10$

Oct 22-10:14 PM

1.5 Translating Verbal Statements

_____ 3. There are p pencils to be put into b school boxes equally. Write an equation for n , the number of pencils in each box.

Answer: $n = p/b$

Oct 30-7:40 AM

1.5 Translating Verbal Statements

- _____ 2. Write the equation for: The product of a number and one more than the number is the number increased by seven hundred seven. Let the number be n .

Answer: $n(n+1) = n+707$

Oct 30-7:41 AM

1.6 Area and Perimeter of 2-D Shapes

- _____ 3. What is the perimeter of a rectangle twice as long as it is wide if the long side is 100 inches?

Answer: 300 in

$p = 2L + 2W$. The width is $\frac{1}{2}$ as long as the length. If the length is 100, the width is $\frac{1}{2} * 100 = 50$. $2*100 + 2*50 = 300$

Dec 3-11:54 PM

1.6 Area and Perimeter of 2-D Shapes

2. If an eight inch pie is cut in to eight equal pieces, what is the perimeter of one piece? Answer in terms of π .



Answer: $8 + \pi$ in

The pie is in 8 equal pieces so each piece consists of the twice the radius (4×2) and $1/8$ th of the circumference. Using $C = \pi d/8$, the circumference portion is $\pi 8/8 = \pi$. Add together: $8 + \pi$.

Dec 3-11:55 PM

1.6 Area and Perimeter of 2-D Shapes

1. If the radius of a circle is exactly $\frac{5}{\pi}$ cm, what is the circumference?

Answer: 10 cm

$$C = \pi d \quad d = 2r \quad \pi \cdot 2 \cdot \frac{5}{\pi} = 10$$

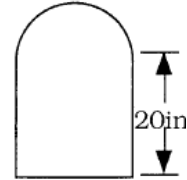
Dec 3-11:56 PM

1.6 Area and Perimeter of 2-D Shapes

_____ 3. A 16 in. by 20 in. rectangular window has a semicircle on one of the shorter ends. What is the perimeter in terms of π ?

Answer: $56+8\pi$ in

Circumference of a semicircle is $\pi d/2$. Perimeter =
 $20+16+20+\pi 16/2 = 56+8\pi$



Dec 3-11:57 PM

1.6 Area and Perimeter of 2-D Shapes

_____ 1. What time is it, to the nearest minute, if the angle between the hands on a clock is 35° , the hour hand is between 4 and 5, and the minute hand is between 5 and 6?

Answer: 4:28

The hour hand between 4 & 5 and the minute hand between 5 & 6 means the time is between 4:25 and 4:30. 35 degrees means $35/360 = x/60$ where x is approximately 6 minutes between the hour hand and the minute hand. Estimated guess is 4:28.

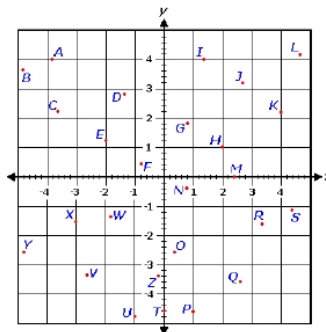
Dec 3-11:59 PM

1.7 The Coordinate Plane

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Dec 3-11:59 PM

1.7 The Coordinate Plane

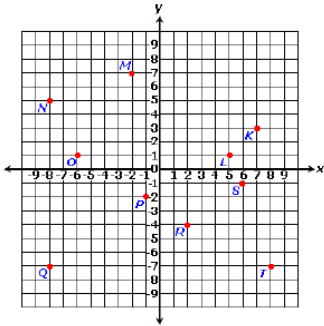


What are the coordinates of point B?

Answer: (-4.8,3.6)

Sep 24-7:12 PM

1.7 The Coordinate Plane



Which point is at (-8,-7)?

Answer: Q

Sep 24-7:14 PM

1.8 Measures of Central Tendency

_____ 4. If scores of 60, a , 75, a , a , 90 average to 80, what is a ?

Answer: 85

If the average is 80, the sum of the scores divided by the number of scores will equal 80. $(60+75+90+3a)/6 = 80$. $225+3a = 480$. $3a = 255$. $a = 85$.

Oct 22-7:39 AM

1.8 Measures of Central Tendency

a _____ 2. Given: 40, 35, 7, 40, 21, 18, 27.

a. What is the mode?

b _____ b. What is the median

Answer: a) 40 b) 27

Feb 2-7:43 PM

1.8 Measures of Central Tendency

_____ 4. If the mean, median, mode, and range of a set of data are 45, 45, 41, and 9 respectively, and you add 75 to the data list, which will change the most: mean, median, or mode?

Answer: mean

75 is a new number in the data set so the mode will not change. The medium will increase but not as much as the mean.

Feb 2-7:43 PM

1.8 Measures of Central Tendency

_____4. Sarah earned scores of 80, 90, and 95 on her first three tests. What does she need to score on her fourth test to average 90?

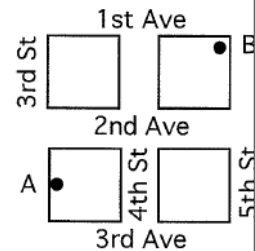
Answer: 95

$$(80+90+95+x)/4 = 90. \quad 265+x = 360. \quad x = 95.$$

Feb 2-7:48 PM

1.9 Logic Problems

_____4. Alice lived on 3rd St, in the middle of the block, on the west side between 2nd Ave. and 3rd Ave., and Beth lived at the southwest corner of the intersection of 5th St. and 1st Ave. How far must Alice walk to get to Beth's house? Alice stays on the side of the road and uses the crosswalks and goes the shortest route. The blocks are 400 feet long, and the streets are 100 feet wide.



Answer: 1600 ft

Alice must go 3 1/2 blocks and cross 2 streets. $3.5 \cdot 400 + 2(100) = 1600.$

Feb 2-7:48 PM

1.9 Logic Problems

- _____ 3. Jenni needed 144 squares 7 1/2 inches on a side to make a quilt. Half were plain fabric, half were flowered fabric. If each roll of fabric is 43 inches wide, what length of plain fabric does she need, to the nearest 1/8 of a yard

Answer: 3 1/8 yards

$43/7.5 = 5.7$ so five squares across. We need 72 squares of each pattern:
 $72/5 = 14.4$ so 15 rows. $15 * 7.5 = 112.5$ inches in length. 36 inches per yards
 so $112.5 / 36 = 3.125$ or 3 1/8 yards.

Feb 2-7:48 PM

1.9 Logic Problems

- _____ 2. Peter walked on a treadmill for 40 minutes. The treadmill was set at a pace equivalent to 3 miles per hour. How many miles did Peter walk?

Answer: 2 miles

Formula $d=rt$. Convert 40 minutes to hours = $2/3$. $d=3*2/3 = 2$ miles.

Feb 2-7:48 PM