

Name _____ School _____

JUNIOR DIVISION

Category 1: Real, Rational and Irrational Numbers (includes simplifying radicals)

CALCULATORS NOT ALLOWED

1. (2 pts) Which are rational numbers? 1. _____

A. $\sqrt{37}$

B. $\frac{13}{47}$

C. 19

D. π

2. (3pts) Simplify $\sqrt{360}$. 2. _____

3. (5 pts) Simplify: $\sqrt{27} + \sqrt{75} + \sqrt{48} + \sqrt{12} =$
3. _____

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Category 2: Solving Simple Equations

CALCULATORS NOT ALLOWED

1. (2pts) Solve for x: $-2x - 3x - (-9x) = 28$ 1. _____

2. (3 pts) Solve for x: $\frac{x-2}{x-5} = \frac{x-3}{x-4}$ 2. _____

3. (5pts) Solve for x: $3^x \cdot 4^x \cdot 5^x = 5^x \cdot 12^x$

3. _____

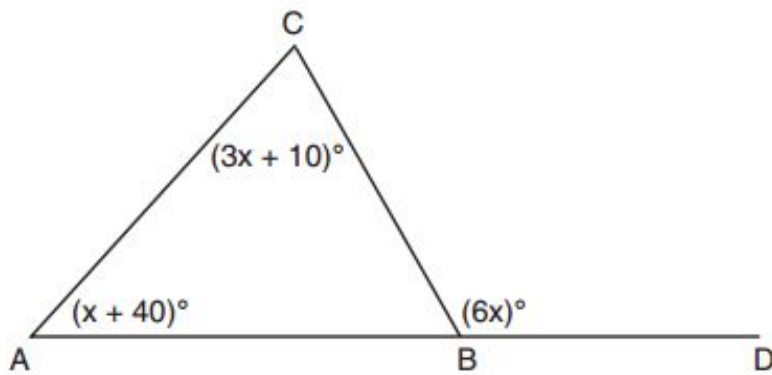
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Category 3: Lines, Angles and Triangles

1. (2pts) A quadrilateral has internal angles measuring x , $2x$, $3x$, and $4x$. What is the value of x ?

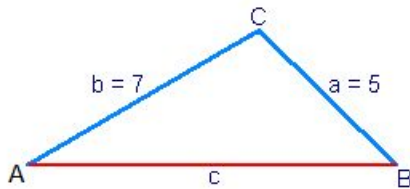
1. _____

2. (3pts) What is the measure of $\angle ABC$?



2. _____
degrees

3. (5pts.) What are all of the possible values for the length of side c ?



3. _____

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Category 4: Team Combinations and Permutations (Pass in only one paper)

CALCULATORS NOT ALLOWED

1. 1. (2Pts) What is the value of?

A. ${}_4P_2$

ANS A. _____

B. ${}_4C_2$

ANS B. _____

2. (3pts) There are 6 people waiting for a taxi. The taxi can only carry 4 passengers. How many different ways can 4 passengers get into the taxi?

2. _____

3. (5pts) There are 6 girls and 4 boys who want to be on the math team. How many different ways can a team be formed with 3 girls and 2 boys.

3. _____