NMAθ 2002
THETA School Bowl

Round # _____

A = _____

B = _____

C = _____

Final answer:

CODE: _____

NMAθ 2002
THETA School Bowl

Round # _____

A = _____

B = _____

C = _____

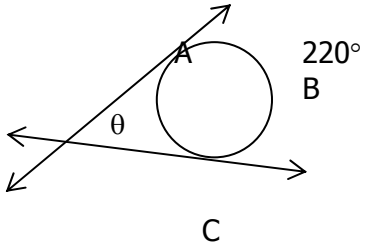
Final answer:

CODE: _____

NMAθ 2002
THETA School Bowl

Round 1

Part 1
Given that the lines are tangent to the circle, find the measure of $\angle\theta$ if arc $\overset{\frown}{ABC}$ is 220°.



A = the numerical value of $\angle\theta$.

Part 2
Find $\begin{bmatrix} 2 & -1 \\ 4 & 2 \end{bmatrix} + 3\begin{bmatrix} -1 & 2 \\ 2 & 0 \end{bmatrix} - 2\begin{bmatrix} 5 & 4 \\ 1 & -2 \end{bmatrix}$

B = the row 2 column 1 entry if the answer matrix.

Part 3
Simplify: $\dfrac{\left(4^{n+1}\right)\left(16^{n+1}\right)}{\left(4^3\right)^{n+1}}$

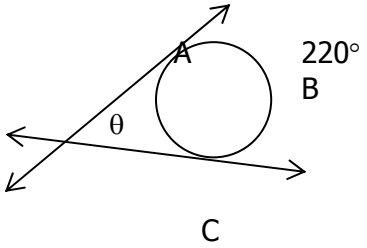
C = answer to Part 3

Final answer = $\dfrac{A}{B} + C$

NMAθ 2002
THETA School Bowl

Round 1

Part 1
Given that the lines are tangent to the circle, find the measure of $\angle\theta$ if arc $\overset{\frown}{ABC}$ is 220°.



A = the numerical value of $\angle\theta$.

Part 2
Find $\begin{bmatrix} 2 & -1 \\ 4 & 2 \end{bmatrix} + 3\begin{bmatrix} -1 & 2 \\ 2 & 0 \end{bmatrix} - 2\begin{bmatrix} 5 & 4 \\ 1 & -2 \end{bmatrix}$

B = the row 2 column 1 entry if the answer matrix.

Part 3
Simplify: $\dfrac{\left(4^{n+1}\right)\left(16^{n+1}\right)}{\left(4^3\right)^{n+1}}$

C = answer to Part 3

Final answer = $\dfrac{A}{B} + C$

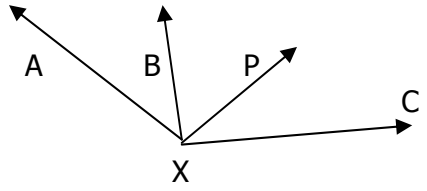
NMAθ 2002
THETA School Bowl

Round 2

Part 1

$m\angle AXB = 3x - 1, m\angle PXB = 2x - 3,$
$m\angle PXC = 4x + 6, m\angle AXC = 128°$

A = the measure of the smallest angle.



Part 2

Given $f(x) = 5x^2 - 6$, B = $f(-3)$.

Part 3

Find the quotient:

$$\frac{3x^6 + 2x^5 - 8x^4 + 2x^2 + 4x}{x + 2}$$

C = coefficient of the x^4 term

Final: $\frac{A + B}{C}$

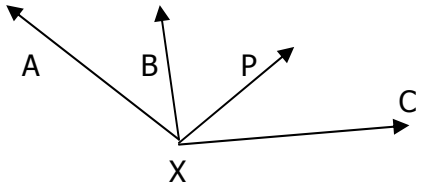
NMAθ 2002
THETA School Bowl

Round 2

Part 1

$m\angle AXB = 3x - 1, m\angle PXB = 2x - 3,$
$m\angle PXC = 4x + 6, m\angle AXC = 128°$

A = the measure of the smallest angle.



Part 2

Given $f(x) = 5x^2 - 6$, B = $f(-3)$.

Part 3

Find the quotient:

$$\frac{3x^6 + 2x^5 - 8x^4 + 2x^2 + 4x}{x + 2}$$

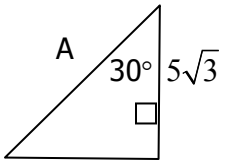
C = coefficient of the x^4 term

Final: $\frac{A + B}{C}$

NMAθ 2002
THETA School Bowl

Round 3

Part 1
Find A given:



Part 2

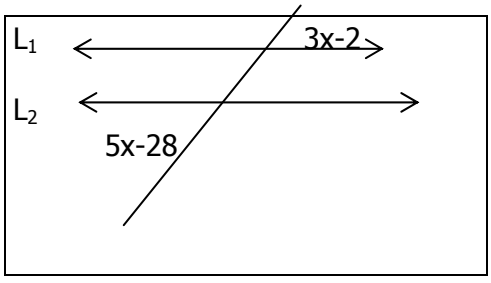
Solve for x:

$$\frac{2}{x}+\frac{1}{x-2}=1$$

B = sum of the solutions

Part 3

Given $L_1 \parallel L_2$ find x.



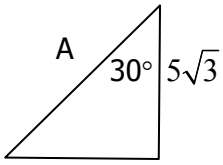
C = x

Final: $C^{\frac{A}{B}}$

NMAθ 2002
THETA School Bowl

Round 3

Part 1
Find A given:



Part 2

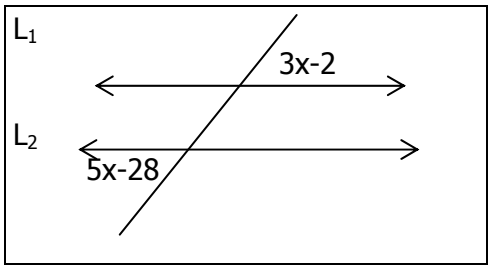
Solve for x:

$$\frac{2}{x}+\frac{1}{x-2}=1$$

B = sum of the solutions

Part 3

Given $L_1 \parallel L_2$ find x.



C = x

Final: $C^{\frac{A}{B}}$

NMAθ 2002
THETA School Bowl

Round 4

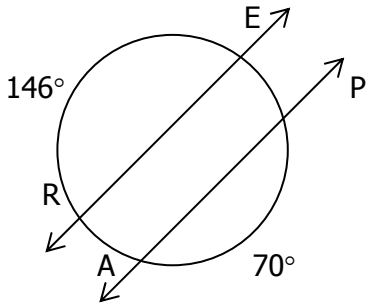
Part 1
A line contains the points (-1, 1) and (3, 9). Find its x – intercept.
A = value of the x-intercept

Part 2
Multiply, express answer in a +bi form:

$(2+3i)(-3+5i)$

B = a in (a +bi) of the answer

Part 3
The length of $\overset{\frown}{AR}$ is 40π cm. If $\overleftrightarrow{PA}$ is parallel to $\overleftrightarrow{RE}$, find the radius of the circle.



C = radius of the circle

Final: $C - \frac{B}{A}$

NMAθ 2002
THETA School Bowl

Round 4

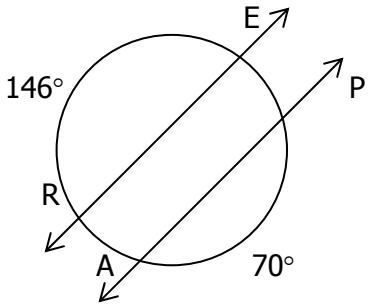
Part 1
A line contains the points (-1, 1) and (3, 9). Find its x – intercept.
A = value of the x-intercept

Part 2
Multiply, express answer in a +bi form:

$(2+3i)(-3+5i)$

B = a in (a +bi) of the answer

Part 3
The length of $\overset{\frown}{AR}$ is 40π cm. If $\overleftrightarrow{PA}$ is parallel to $\overleftrightarrow{RE}$, find the radius of the circle.

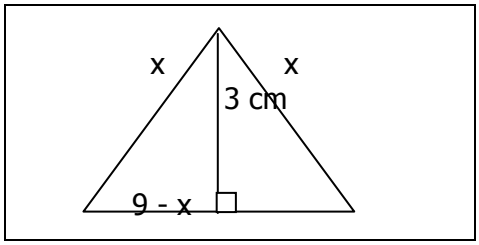


C = radius of the circle

Final: $C - \frac{B}{A}$

Round 5

Part 1
Find the perimeter of the triangle using the figure.



A = perimeter

Part 2
Write the solution as a single inequality statement : $-3 \le 2x - 5 \le 11$

B = maximum value of the solution

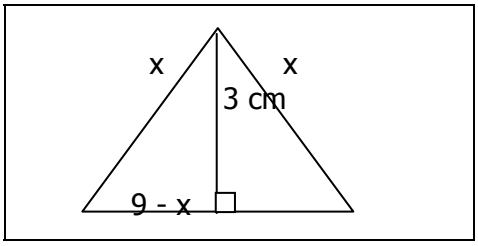
Part 3
The length and the width of a rectangle have a ratio of 3:2. The area of the rectangle is 54.
C = larger side of the rectangle

Final: $B^{\frac{A}{C}}$

NMAθ 2002
THETA School Bowl

Round 5

Part 1
Find the perimeter of the triangle using the figure.



A = perimeter

Part 2
Write the solution as a single inequality statement : $-3 \le 2x - 5 \le 11$

B = maximum value of the solution

Part 3
The length and the width of a rectangle have a ratio of 3:2. The area of the rectangle is 54.
C = larger side of the rectangle

Final: $B^{\frac{A}{C}}$

NMAθ 2002
THETA School Bowl

Round 6

Part 1
The vertex angle of an isosceles triangle is 23° less than two-and-one-half times the sum of the measures of the two base angles.

A = the measure of one of the base angles

Part 2
Solve for x: $x - 7\sqrt{x} + 10 = 0$

B = sum of the solution(s)

Part 3
Rose spends $149 each month on gas, electricity and water. The charge for gas is $7 more than four times the water charge. Electricity costs $2 less than three times the water.

C = the cost of gas

Final: $B(C - A)$

NMAθ 2002
THETA School Bowl

Round 6

Part 1
The vertex angle of an isosceles triangle is 23° less than two-and-one-half times the sum of the measures of the two base angles.

A = the measure of one of the base angles

Part 2
Solve for x: $x - 7\sqrt{x} + 10 = 0$

B = sum of the solution(s)

Part 3
Rose spends $149 each month on gas, electricity and water. The charge for gas is $7 more than four times the water charge. Electricity costs $2 less than three times the water.

C = the cost of gas

Final: $B(C - A)$

NMAθ 2002
THETA School Bowl

Round 7

Part 1
Given that $x^2 - kx + 121$ is a perfect trinomial square, what is the value for k?

A = k

Part 2
Evaluate:

$$(32)^{\frac{1}{5}} - \left(\frac{3}{2}\right)^{-1} + \left(\frac{1}{8}\right)^{-\frac{2}{3}} + \left(\frac{8}{27}\right)^{\frac{1}{3}}$$

B = answer to part 2

Part 3
Solve the system: $\begin{aligned} 4x + 3y &= 27 \\ y &= 2x - 1 \end{aligned}$

C = product of the solution

Final: $C^2 - B^3 - A$

NMAθ 2002
THETA School Bowl

Round 7

Part 1
Given that $x^2 - kx + 121$ is a perfect trinomial square, what is the value for k?

A = k

Part 2
Evaluate:

$$(32)^{\frac{1}{5}} - \left(\frac{3}{2}\right)^{-1} + \left(\frac{1}{8}\right)^{-\frac{2}{3}} + \left(\frac{8}{27}\right)^{\frac{1}{3}}$$

B = answer to part 2

Part 3
Solve the system: $\begin{aligned} 4x + 3y &= 27 \\ y &= 2x - 1 \end{aligned}$

C = product of the solution

Final: $C^2 - B^3 - A$

NMAθ 2002
THETA School Bowl

Round 8

Part 1
Solve for x, express answer as an inequality: $\left|\frac{x-2}{3}\right| \le 5$

A = minimum value of the answer

Part 2
The measure of the vertex angle of an isosceles triangle is 110°.

B = the measure of one base angle.

Part 3
Simplify by performing the indicated operations:
$3(5m+4)(m-6) - 2(m-6)(3m+7)$

C = sum of the coefficients of the answer to part 3

Final: $(B + C)^A$

NMAθ 2002
THETA School Bowl

Round 8

Part 1
Solve for x, express answer as an inequality: $\left|\frac{x-2}{3}\right| \le 5$

A = minimum value of the answer

Part 2
The measure of the vertex angle of an isosceles triangle is 110°.

B = the measure of one base angle.

Part 3
Simplify by performing the indicated operations:
$3(5m+4)(m-6) - 2(m-6)(3m+7)$

C = sum of the coefficients of the answer to part 3

Final: $(B + C)^A$

NMAθ 2002
THETA School Bowl

Round 9

Part 1
A line passes through the points (-3,1) and (4,k) and has a slope of $\frac{1}{2}$.

A = k

Part 2
Perform the operation:

$$\frac{x^2+3x-54}{x^2-81} \div \frac{x^2-10x+24}{x^2-10x+9}$$

B = numerator - denominator

Part 3
Find the EXACT answer in simplest radical form for: $3\sqrt[3]{54}+9\sqrt[3]{16}-2\sqrt[3]{128}$

C = coefficient of the answer

Final: $6A-4B+C$

NMAθ 2002
THETA School Bowl

Round 9

Part 1
A line passes through the points (-3,1) and (4,k) and has a slope of $\frac{1}{2}$.

A = k

Part 2
Perform the operation:

$$\frac{x^2+3x-54}{x^2-81} \div \frac{x^2-10x+24}{x^2-10x+9}$$

B = numerator - denominator

Part 3
Find the EXACT answer in simplest radical form for: $3\sqrt[3]{54}+9\sqrt[3]{16}-2\sqrt[3]{128}$

C = coefficient of the answer

Final: $6A-4B+C$

NMAθ 2002
THETA School Bowl

Round 10

Part 1
From a variety of locations in a lake, a biologist catches 80 fish, then tags and returns them to the lake. A week later, 60 fish are caught from the same locations. Exactly 12 of the 60 fish have tags. Assume that both catches are taken randomly.

A = the estimate of fish in the entire lake

Part 2
If Herman's test grade and quiz grade are equally weighted, his average would be 85. If the test counts for 3 times as much as the quiz, his average is 83.

B = his test grade

Part 3
Solve for x: $\begin{vmatrix} -3 & x \\ 7 & -8 \end{vmatrix} = 10$

C = x

Final: $\left(\sqrt{A} - \sqrt{B}\right)^C$

NMAθ 2002
THETA School Bowl

Round 10

Part 1
From a variety of locations in a lake, a biologist catches 80 fish, then tags and returns them to the lake. A week later, 60 fish are caught from the same locations. Exactly 12 of the 60 fish have tags. Assume that both catches are taken randomly.

A = the estimate of fish in the entire lake

Part 2
If Herman's test grade and quiz grade are equally weighted, his average would be 85. If the test counts for 3 times as much as the quiz, his average is 83.

B = his test grade

Part 3
Solve for x: $\begin{vmatrix} -3 & x \\ 7 & -8 \end{vmatrix} = 10$

C = x

Final: $\left(\sqrt{A} - \sqrt{B}\right)^C$