

C of C Math Meet 2006 (samples) / Varsity Team Elimination / Round 0

Question 1:

A point is 13 inches from the center of a circle of radius 5 inches. A tangent line to the circle goes through that point. What is the length in inches of the line segment between the point and the circle?

See Answer

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Question 1:

A point is 13 inches from the center of a circle of radius 5 inches. A tangent line to the circle goes through that point. What is the length in inches of the line segment between the point and the circle?

Answer: 12 inches

or: $\sqrt{144}$ inches

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Question 2:

If $1 + 2 + 3 + \cdots + n = 10n$, where $n > 0$, find n .

See Answer

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Question 2:

If $1 + 2 + 3 + \cdots + n = 10n$, where $n > 0$, find n .

Answer: $n = 19$

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Question 3:

An airplane flew from town A to town B in 2 hours, when there was no wind. The return trip with a 20 mile per hour tail wind took only 1 hour and 45 minutes. How far is town A from town B?

See Answer

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Question 3:

An airplane flew from town A to town B in 2 hours, when there was no wind. The return trip with a 20 mile per hour tail wind took only 1 hour and 45 minutes. How far is town A from town B?

Answer: 280 miles

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Question 4:

If the product $\frac{3}{2} \cdot \frac{4}{3} \cdot \frac{5}{4} \cdot \frac{6}{5} \cdot \dots \cdot \frac{a}{b} = 9$, what is the sum of a and b ?

See Answer

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Question 4:

If the product $\frac{3}{2} \cdot \frac{4}{3} \cdot \frac{5}{4} \cdot \frac{6}{5} \cdot \dots \cdot \frac{a}{b} = 9$, what is the sum of a and b ?

Answer: 35

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Question 5:

Find the area of the smallest rectangle whose area, in square meters, is half its perimeter, in meters.

[See Answer](#)

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Question 5:

Find the area of the smallest rectangle whose area, in square meters, is half its perimeter, in meters.

Answer: 4 or 4 square meters

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Question 6:

Find the sum of all the solutions of $3x^4 + 5x^3 - 17x^2 - 25x + 10 = 0$.

See Answer

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Question 6:

Find the sum of all the solutions of $3x^4 + 5x^3 - 17x^2 - 25x + 10 = 0$.

Answer: $-\frac{5}{3}$

See Next Question

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Question 7:

A regular hexagon is inscribed in a circle. Find the exact value of the ratio of the circumference of the circle to the perimeter of the hexagon.

See Answer

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Question 7:

A regular hexagon is inscribed in a circle. Find the exact value of the ratio of the circumference of the circle to the perimeter of the hexagon.

Answer: $\frac{\pi}{3}$

See Next Question

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Question 8:

Find the first coordinate of the vertex of the parabola

$$y = (x + 6)^2 + (x - 2)^2 + (x + 3)^2 + (x - 5)^2.$$

See Answer

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Question 8:

Find the first coordinate of the vertex of the parabola

$$y = (x + 6)^2 + (x - 2)^2 + (x + 3)^2 + (x - 5)^2.$$

Answer: $x = -\frac{1}{2}$

See Next Question

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Question 9:

Determine all x-coordinates of the point (x, y) on the line $y = x + 4$ that are $\sqrt{101}$ units from the point $(12, 5)$.

See Answer

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Question 9:

Determine all x-coordinates of the point (x, y) on the line $y = x + 4$ that are $\sqrt{101}$ units from the point $(12, 5)$.

Answer: $x = 11$ and $x = 2$

See Next Question

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Question 10:

Evaluate the sum $\sum_{k=1}^{99} \log_{10} \left(\frac{k+1}{k} \right)$

See Answer

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Question 10:

Evaluate the sum $\sum_{k=1}^{99} \log_{10} \left(\frac{k+1}{k} \right)$

Answer: 2

See Next Question