

CORAL SPRINGS INVITATIONAL MATHEMATICS COMPETITION

ALGEBRA I TEAM

MARCH 28, 1992

QUESTION # 1

Find the product of the first 13 whole numbers.

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QUESTION # 2

Find the slope of the line with equation  $7x-5y+17=2x-8y-3$ .

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QUESTION # 3

Solve for b:  $b-4=3b-8$

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QUESTION # 4

Multiply:  $(s-2)^2(s+7)$

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QUESTION # 5

Scott is three years younger than Chris. Ten years from now, Scott's age will be nine tenths of Chris's age then. How old is Scott now?

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QUESTION # 6

Eric has 10 grams of a solution that is 70% water and 30% acid. How many grams of a 5% acid solution must he add to obtain a 20% acid solution?

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QUESTION # 7

Simplify: 
$$\frac{a + \frac{b^3}{a^2}}{\frac{b^2}{a} - \frac{b}{a} + 1}$$

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QUESTION # 8

$$f^3 / f^5 \times f^6 \times (f^{-2})^2 / f^{-3} / f^4 = f^n$$

Solve for n.

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QUESTION # 9

Find the equation of the line perpendicular to  $2x-3y+11=0$  at the point  $(-1,3)$ , in  $Ax+By+C=0$  form.

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QUESTION # 10

If  $k=-2$ , then find  $7-2k-5k^2-k^3+3k^4+k^5$ .

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QUESTION # 11

$$\begin{aligned} 5x+2y &= -2 \\ 3x-4y &= 10 \end{aligned}$$

Find the ordered pair  $(x,y)$ .

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QUESTION # 12

Find the least common multiple of 12 and 21.

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QUESTION # 13

$$\frac{e^2 - 5e - 6}{2e^2 - 9e - 18} + \frac{e + 2}{2e + 3} = ?$$

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QUESTION # 14

State the range of the function  $y = 3x^2 + 2x + 4$ ,  $x \geq 0$ .

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QUESTION # 15

$$\text{Simplify: } \frac{2u^2 + 5u - 3}{u^2 - 3u - 4} \div \frac{2u^2 + 3u - 2}{u^2 - 2u - 3}$$