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Quiz 4

This quiz is graded out of 15 marks. No books, watches, notes or cell phones are allowed. You must show all your work, the correct answer is worth 1 mark the remaining marks are given for the work. If you need more space for your answer use the back of the page.

Question 1. The length of a rectangular pool is 3 meters less than twice the width. If the pool's perimeter is 108 meters, what is its width?

a. *(2 marks)* Write an equation to model the problem. Use x to represent the width of the pool.

$$2x + 2(2x-3) = 108$$

b. *(2 marks)* Solve the equation to find the width of the pool.

$$2x + 4x - 6 = 108$$
$$6x = 114$$
$$x = 19$$

Question 2. *(5 marks)* An apple contains 80 calories and 3g of fiber. A banana contains 135 calories and 4g of fiber. Set up and solve a system of equations to determine the number of apples (A) and bananas (B) that should be eaten to obtain 3920 calories and 130g of fiber.

① $80A + 135B = 3920$ ← calories
② $3A + 4B = 130$ ← fiber

From ②
$$3A = 130 - 4B$$
$$A = \frac{130 - 4B}{3}$$

sub into ①
$$80\left(\frac{130-4B}{3}\right) + 135B = 3920$$
$$3\left(80\frac{(130-4B)}{3} + 135B\right) = 3(3920)$$
$$80(130-4B) + 405B = 11760$$

$$10400 - 320B + 405B = 11760$$
$$85B = 1360$$
$$B = 16$$

Sub into ②
$$3A + 4(16) = 130$$
$$3A = 66$$
$$A = 22$$

∴ 22 apples and 16 bananas

Question 3. *(5 marks)* Solve the following equation by <u>factoring</u>: $8x^3 + 25x = 30x^2$.

$$8x^3 - 30x^2 + 25x = 0$$
$$x(8x^2 - 30x + 25) = 0 \qquad \text{and} \qquad 8(25) = 200 = ab$$
$$x(8x^2 - 20x - 10x + 25) = 0 \qquad a + b = -30$$
$$x(4x(2x-5) - 5(2x-5)) = 0 \qquad -20 - 10 = -30$$
$$x((2x-5)(4x-5)) = 0$$

$x=0$ $2x-5=0$ $4x-5=0$
$\quad\quad x = \frac{5}{2}$ $x = \frac{5}{4}$

∴ $x = 0, \frac{5}{2}, \frac{5}{4}$