Problem # 1:

A company produces widgets at a rate of 150 widgets per hour. The company operates for 8 hours per day. The cost to produce each widget is $2.50. The company also incurs a fixed cost of $200 per day for operating expenses. If the widgets are sold at a price of $5.00 each, how much profit does the company make in a day?

Explanation:

To solve this problem, we need to calculate the total revenue and total cost, and then subtract the total cost from the total revenue to find the profit.

Calculate the total number of widgets produced in a day:

Number of widgets per hour = 150
Number of hours per day = 8
Total number of widgets per day = Number of widgets per hour * Number of hours per day

Total number of widgets per day = 150 * 8 = 1200 widgets

Calculate the total revenue:

Price per widget = $5.00
Total revenue per day = Price per widget * Total number of widgets per day

Total revenue per day = $5.00 * 1200 = $6000

Calculate the total cost:

Cost per widget = $2.50

Total cost per day for producing widgets = Cost per widget * Total number of widgets per day

Total cost per day for producing widgets = $2.50 * 1200 = $3000

Fixed operating expenses per day = $200

Total cost per day = Total cost per day for producing widgets + Fixed operating expenses per day

Total cost per day = $3000 + $200 = $3200

Calculate the profit:
Profit per day = Total revenue per day - Total cost per day

Profit per day = $6000 - $3200 = $2800

Therefore, the company makes a profit of $2800 per day.

Problem #2: A recipe calls for 2 1/2 cups of flour, but you only have a 3/4 cup measuring cup. How many times do you need to fill the measuring cup to get the required amount of flour?

Explanation:

To find out how many times we need to fill the 3/4 cup measuring cup to get the required amount of flour (2 1/2 cups), we can set up a division problem:

2 1/2 ÷ 3/4

To divide fractions, we can multiply the first fraction by the reciprocal of the second fraction:

2 1/2 * 4/3

Convert the mixed number to an improper fraction:

5/2 * 4/3

Multiply the numerators and denominators:

(5 * 4) / (2 * 3) = 20/6

Simplify the fraction:

20/6 = 10/3

Therefore, you need to fill the 3/4 cup measuring cup 10/3 times to get the required amount of flour.

Problem #3: A car travels at a constant speed of 60 miles per hour. How far will the car travel in 3.5 hours?

Explanation:

To calculate the distance the car will travel, we can use the formula: distance = speed × time.

Speed = 60 miles per hour
Time = 3.5 hours

Distance = 60 × 3.5 = 210 miles

Therefore, the car will travel 210 miles in 3.5 hours.

Problem #4: The ratio of boys to girls in a classroom is 3:5. If there are 36 students in total, how many girls are there?

Explanation:

Let's represent the number of boys as B and the number of girls as G.

The ratio of boys to girls is given as 3:5, which means B/G = 3/5.

We know that B + G = 36 (total number of students).

From the ratio, we can express B in terms of G: B = (3/5)G.

Substituting B = (3/5)G into the equation B + G = 36:

(3/5)G + G = 36

Multiply through by 5 to eliminate the fraction:

3G + 5G = 36 × 5
8G = 180

Divide both sides by 8:

G = 180/8
G = 22.5

Since we can't have half of a student, the number of girls must be a whole number. However, we can approximate the number of girls to the nearest whole number, so let's round it up:

G ≈ 23

To find the number of boys, we can substitute the value of G into B = (3/5)G:

B = (3/5) × 23
B = 69/5
B ≈ 13.8

Again, we need a whole number for the number of boys, so let's round it down:

$B \approx 13$

Therefore, there are approximately 13 boys and 23 girls in the classroom.

Problem #5: A rectangular garden has a length of 12 meters and a width of 8 meters. What is the area of the garden?

Explanation:

To calculate the sale price after a 20% discount, we can multiply the original price by 1 minus the discount rate (as a decimal).

Original price = $80
Discount rate = 20% = 0.20

Sale price = Original price - (Discount rate × Original price)

Sale price = $80 - (0.20 × $80)
Sale price = $80 - $16
Sale price = $64

Therefore, the sale price after the 20% discount is $64.