

Max's Mathematical Market: Advanced Fractions Challenge

Learning objective: To apply advanced knowledge of fractions, including equivalence, addition/subtraction of fractions with related denominators, and multi-step reasoning involving money.

Max the monkey is organising a charity market. Use your mathematical reasoning skills to solve these complex problems. Show all your working out clearly, as full marks are awarded for the process, not just the final answer.

Max has set up a fruit stall at the forest market. He has a crate containing 72 pieces of fruit. He notices that $\frac{3}{8}$ of the fruit are apples, $\frac{1}{6}$ are pears, and the remainder are oranges. He decides to sell the apples for £0.60 each and the pears for £0.80 each. Max wants to ensure his pricing remains fair while calculating his total potential revenue.

1. Calculate exactly how many of each fruit (apples, pears, and oranges) Max has in his crate of 72. Explain your method for finding these quantities. (3 marks)

2. If Max sells all his apples and all his pears, what is the total amount of money he will collect? Express your answer in pounds (£). (2 marks)

3. Max decides to give away $\frac{1}{4}$ of his oranges to the other forest animals. How many oranges does he have left? Show your multi-step calculation. (3 marks)

4. Are the fractions of apples ($\frac{3}{8}$) and pears ($\frac{1}{6}$) equivalent? Prove your answer by finding a common denominator and comparing the values. (3 marks)

5. Max finds a new crate containing 96 pieces of fruit. If $\frac{5}{12}$ of this new crate are plums and $\frac{3}{8}$ are peaches, which fruit has a greater quantity? Justify your reasoning using equivalent fractions. (3 marks)

6. If $\frac{1}{3}$ of the total fruit in the new crate (96 pieces) are damaged and cannot be sold, what fraction of the total crate is still in good condition? Write your answer in its simplest form. (2 marks)

7. Max wants to distribute his 96 pieces of fruit into boxes that each hold $\frac{1}{8}$ of the total. How many boxes will he need? If each box costs £2.50 to fill, how much will it cost to fill all the boxes? (3 marks)

Draw: Draw a visual representation of the 72 pieces of fruit, using a bar model to show the proportion of apples, pears, and oranges.



Extension challenge: Max has a secret stash of 120 golden berries. He gives $\frac{2}{5}$ to Pip, $\frac{1}{4}$ of the remaining to Zara, and $\frac{1}{3}$ of what is left to Kit. Write a mathematical explanation detailing how many berries each friend received and how many Max has left for himself.

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