Shopping for data

Purpose:

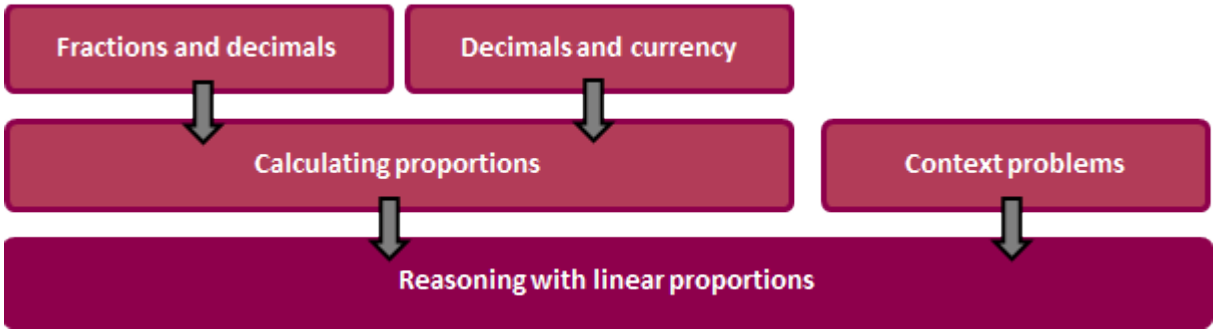
The purpose of this multi-level task is to engage students in using proportional reasoning to find a solution to a problem in context.

Achievement Objectives:

NA5-1: Reason with linear proportions.

Description of mathematics:

The background knowledge and skills that need to be established before and/or during this task are outlined in the diagram below:



This task may be solved using calculations finding the lowest cost per month or by taking further factors from the context into consideration. The approach should be chosen in sympathy with students' skills and depth of understanding.

Activity:

Task: Sally uses a lot of data on her mobile. She is currently with Cellcom and in a long term contract that provides the phone and a monthly 60 minute calls, unlimited texts and 1GB data bundle. Sally actually uses an average of 8GB per month. The extra 7GB of data that she uses is billed at a very high rate ($5 per 50MB). When she pays her monthly mobile bill, she has the option of purchasing additional data bundles at a reduced rate.

Use the table below, showing the specials on data bundles that are available on monthly top ups, for the three mobile providers, Redfone, Cellcom and 3rdDegree, to work out which provider and which bundle(s) would give her the best deal for an additional 7GB per month.

Provider	**Cellcom**	**Redfone**	**3rdDegree**
512 MB	$29.90	$12.50	$20
2 GB	$59.90		$50
4 GB	$79.90		
10 GB			$180

In all cases, any unused data at the end of the month is carried over for a maximum 30 days.

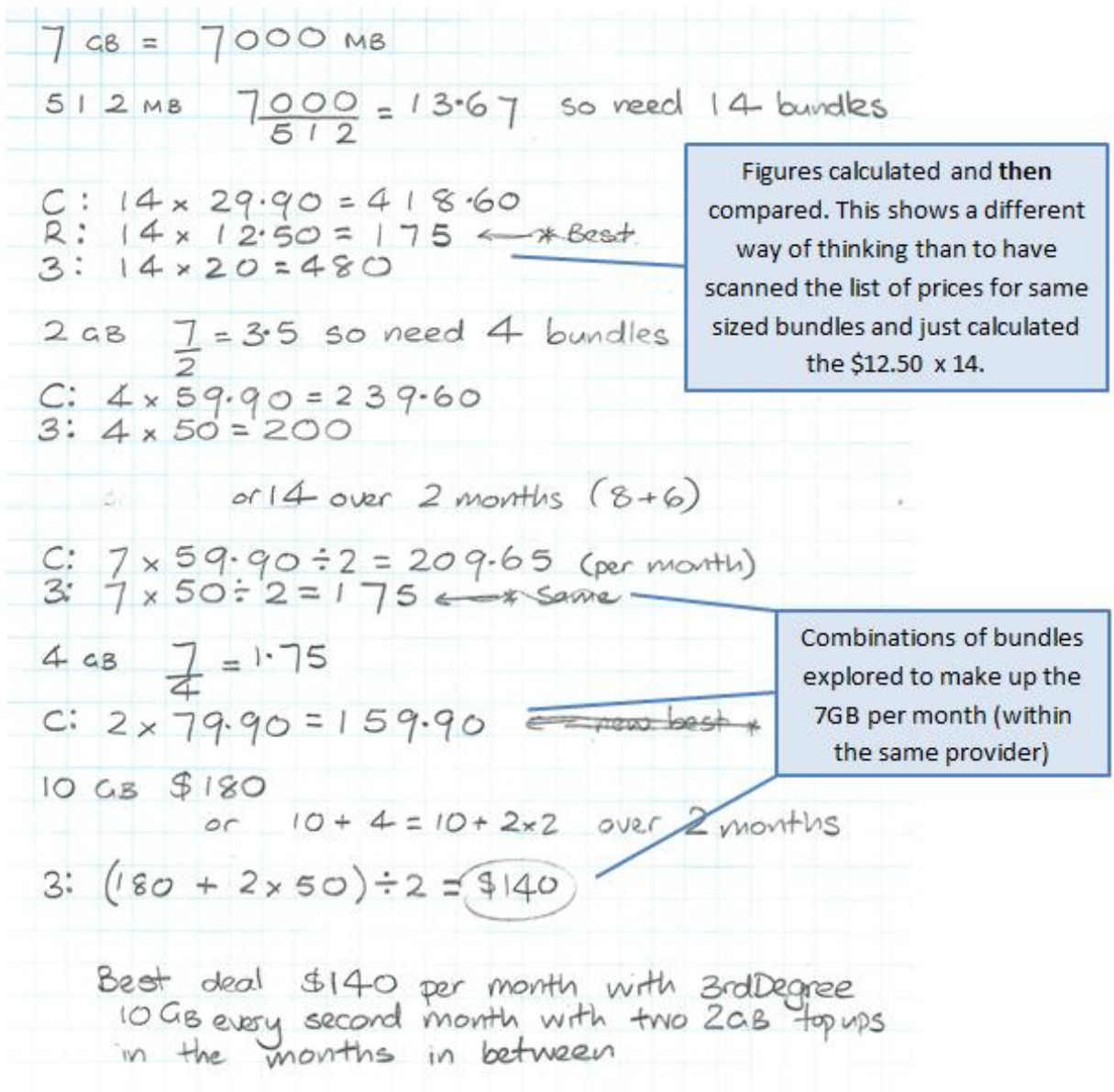
Note, we can assume that the calls, texts and data bundles for Redfone and 3rd Degree are similar. If Sally breaks her contract with Cellcom, she will need to purchase a new phone.

The procedural approach

The student is able to calculate the different costs of data bundles for the required usage, to recommend a purchase plan.

Prompts from the teacher could be:

1. For each of the bundles on offer, consider how many bundles will be needed to make up 7GB of data. Calculate the cost of purchasing 7GB of data for each of these offers.
2. Given that the carry over period for unused data is another month, consider the cost of purchasing 14GB of data over two months. Then work out the cost per month of such a purchase.
3. Find the best deal for Sally.

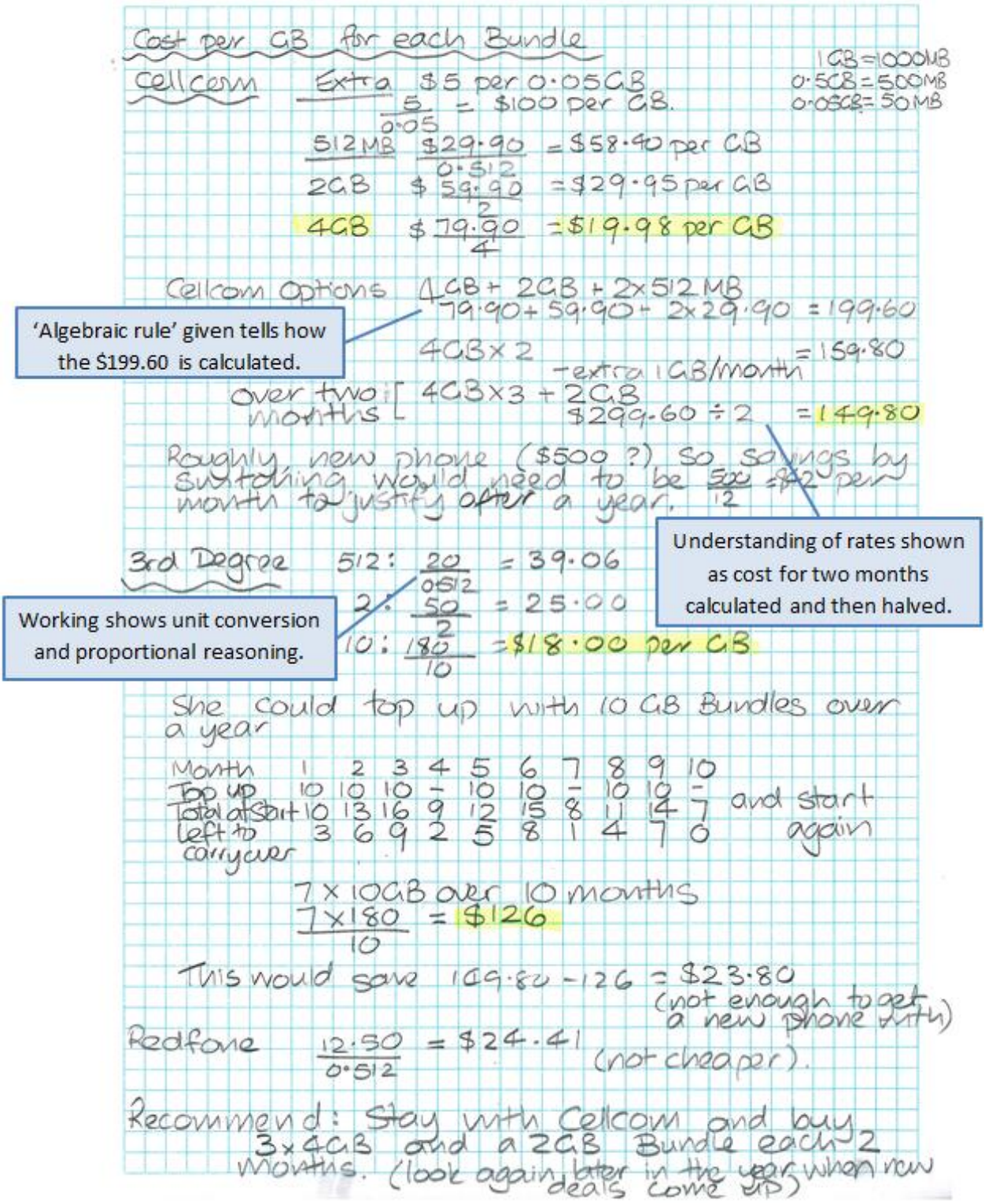


The conceptual approach

The student is able to use the context alongside calculation of the costs of data bundles, to find the optimal solution.

A prompt from the teacher could be:

- Work out the best way of purchasing the data, for each of the three providers Note that the best deal for Sally might not be the cheapest.



'Algebraic rule' given tells how the $199.60 is calculated.

Understanding of rates shown as cost for two months calculated and then halved.

Working shows unit conversion and proportional reasoning.