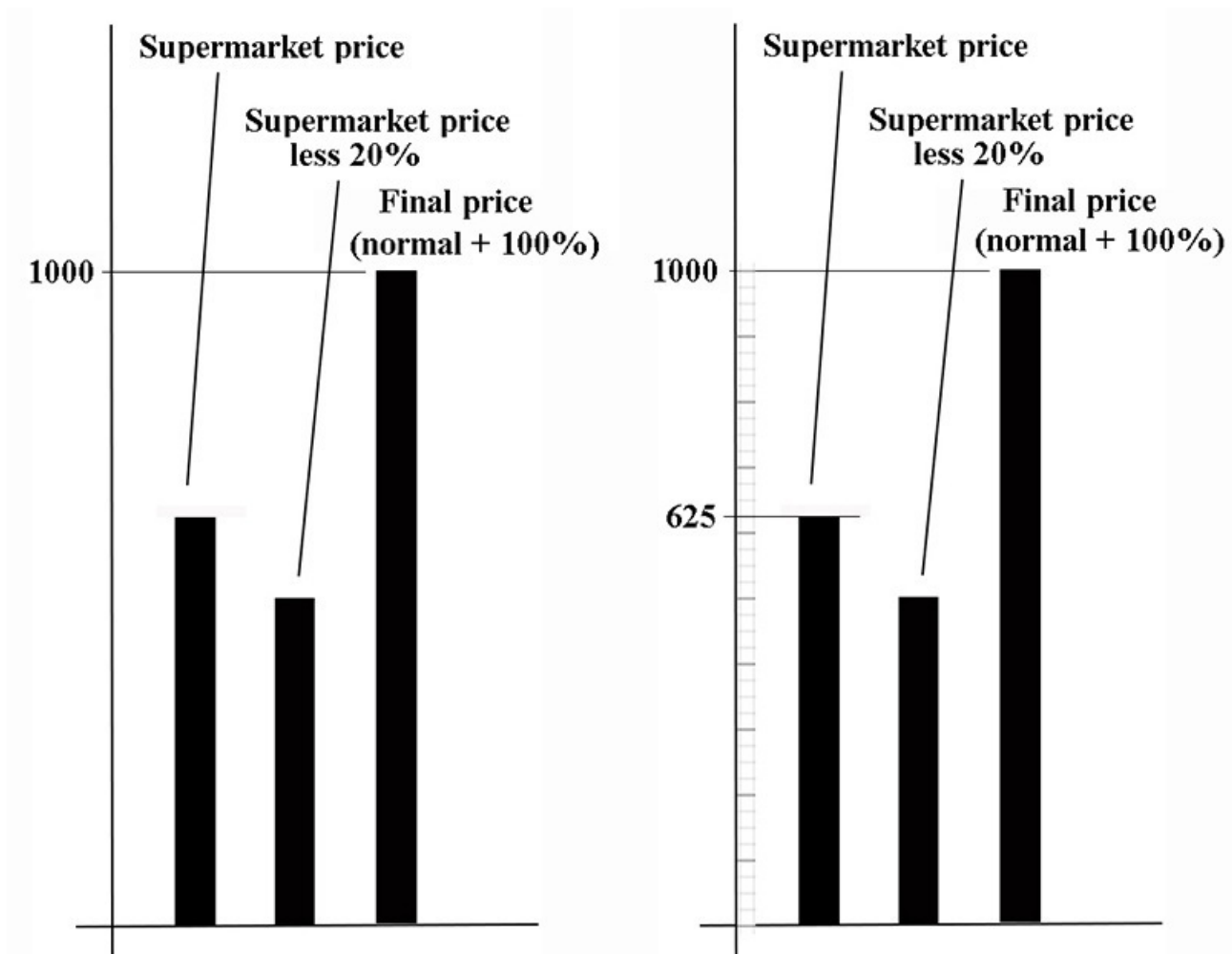


Discounts

Shannon and Ian Jacobs

The local street market has a 20% discount from the supermarket price of fruit and vegetables. Last week was Chinese New Year and for three days the prices at the market went up by 100%. I paid 1000 baht at the market on a high price day. *What would I have paid at a supermarket that didn't raise prices for Chinese New Year? I've been shown three ways to do this.*

1 Sketch a bar graph



The information given is on the left with no scale. Adding a scale from zero to 1000 allows the supermarket price to be read as 625 Baht.

Could you use this method in an exam? Sketch the bar graph. Guess the scale divisions. How long would that take? Would it be accurate enough?

2 Two part calculation

Part 1: let y be the normally discounted price at the market.

$$y + y = 1000$$

$$2y = 1000$$

$$y = 500 \text{ Baht}$$

Part 2: let x be the supermarket price.

$$x - 0.2x = 500$$

$$0.8x = 500$$

$$x = 5000/8$$

$$= 625 \text{ Baht}$$

3 One part calculation

Let x be the supermarket price.

$$(x - 0.2x) + (x - 0.2x) = 1000$$

$$1.6x = 1000$$

$$x = 10000/16$$

$$= 5000/8$$

$$= 625 \text{ Baht}$$

The third method is perhaps best. Write down the equation carefully: with percentages as decimals: pay attention to the signs (+ or -). Solve for x .

The one part calculation above requires the conversion of percentages to decimals. The working will be slightly different if the percentages are converted to fractions.

4 One part calculation with fractions

Let x be the supermarket price.

$$(x - x/5) + (x - x/5) = 1000$$

$$8/5 x = 1000$$

$$x = 5000/8$$

$$= 625 \text{ Baht}$$

Using fractions may sometimes simplify a calculation. The example below is best solved with fractions rather than decimals.

Example

A school snack-shop discounts all items for pupils by 5%. On Fridays an additional 20% discount is given to reduce wastage over the weekend. My bill for Friday afternoon after school was 190 Baht. Let x be full price and find my bill with no discounts.

$$(x - x/20) - 1/5(x - x/20) = 190$$

$$19/20 x - 19/(5 \times 20) x = 190$$

$$5x - x = 1000 \quad \dots \text{ multiplying by } 100/19$$

$$x = 250 \text{ Baht}$$

Be aware that examples in exam papers are often (as here) selected to reduce the need for a calculator.

So: let's set an exam question!

Suppose a cafeteria discounts meals for staff over the visitors by 10%. On Fridays the staff discount is increased by 30%. What is the visitors price for a meal that costs a staff member y Baht on a Friday? We are the examiner: we will set a value for y after doing the working.

Let x be the cost of the meal for a visitor.

$$(x - x/10) - 3/10(x - x/10) = y$$

$$9/10 x - 3/10 x \quad 9/10 x = y$$

$$63/100 x = y$$

$$x = 100/63 y$$

If we make $y = 2 \times 63 = 126$ there is no need for a calculator and the answer is ...

$$x = 200$$

Bar graph solution

This article began with a bar graph, easily made with a computer because a scale can be fitted to the axis in step 4 so the original price can be read (step 5). It is possible to do that by hand but the accuracy might not be sufficient to select the correct answer from five choices.

Follow steps 1-5 (in red) on the sketch. With care a solution to within 5% is possible by hand.

