Doughballs

At the restaurant, dough balls can be ordered in small portions and large portions.

Small Portion 6 dough balls	Large portion 10 dough balls

1) A group of people want to order exactly 44 dough balls. Show how they can do this.

2) A group of people want to order exactly 23 dough balls. Another group want to order 97 doughballs. Explain the issue here.
3) How many ways could you order 30 doughballs?
4) How about 60, 62 or 100 doughballs?
5) Is it possible to order all even multiples of doughballs? Convince me.

6 dough balls = £6	10 dough balls = £8

6) What is the maximum number of doughballs that you can order for £20?
7) How about £100, £200 or £1004?
8) What is the cheapest way to buy 72 doughballs?
9) How about one million and two doughballs?

10) I paid £30 for 36 doughballs. How many of each portion did I buy?
11) I paid £698 for 796 doughballs. How many of each portion did I buy? Is this optimal?

The McNuggets Problem

McNuggets are sold in boxes of 6, 9, and 20.

What is the highest number of nuggets you can never buy?

This problem touches on some great maths topics. Explore further by investigating...

Linear Programming	Number Theory

Doughballs - answers

At the restaurant, dough balls can be ordered in small portions and large portions.

Small Portion 6 dough balls	Large portion 10 dough balls

1) A group of people want to order exactly 44 dough balls. Show how they can do this.

   6 small + 2 large, i.e. $(6 \times 4) + (2 \times 10) = 44$

2) A group of people want to order exactly 23 dough balls. Another group want to order 97 doughballs. Explain the issue here. Odd numbers aren't possible.
3) How many ways could you order 30 doughballs? Two ways: 5 small or 3 large
4) How about 60, 62 or 100 doughballs? 60 = 3 ways: 10 small, 6 large or (5 small or 3 large).
5) Is it possible to order all even multiples of doughballs? Convince me.

6 dough balls = £6	10 dough balls = £8

6) What is the maximum number of doughballs that you can order for £20? You can get 22.
7) How about £100, £200 or £1004? £100 = 122, £200 = 250, £1004 = 1252 doughballs
8) What is the cheapest way to buy 72 doughballs? £60 = 6 large + 2 small
9) How about one million and two doughballs?

10) I paid £30 for 36 doughballs. How many of each portion did I buy?
11) I paid £698 for 796 doughballs. How many of each portion did I buy? Is this optimal?

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