Direct Proportional Graphs

LO: Identify a directly proportional relationship from a graph.

03:00

Complete these coordinate pairs for y = 4x.

1) (3, 12)

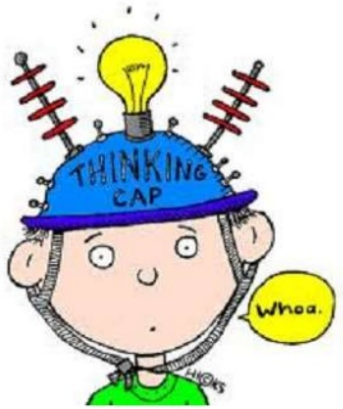
2) (____, 24)

3) (5, ____)

4) (_____, 20)

5) (10, ____)

Mental Math



6) (-2, ____)

7) (____, -28)

8) (-5, ____)

9) (____, -4)

10) (-1/4, ____)

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STARTER

03:00

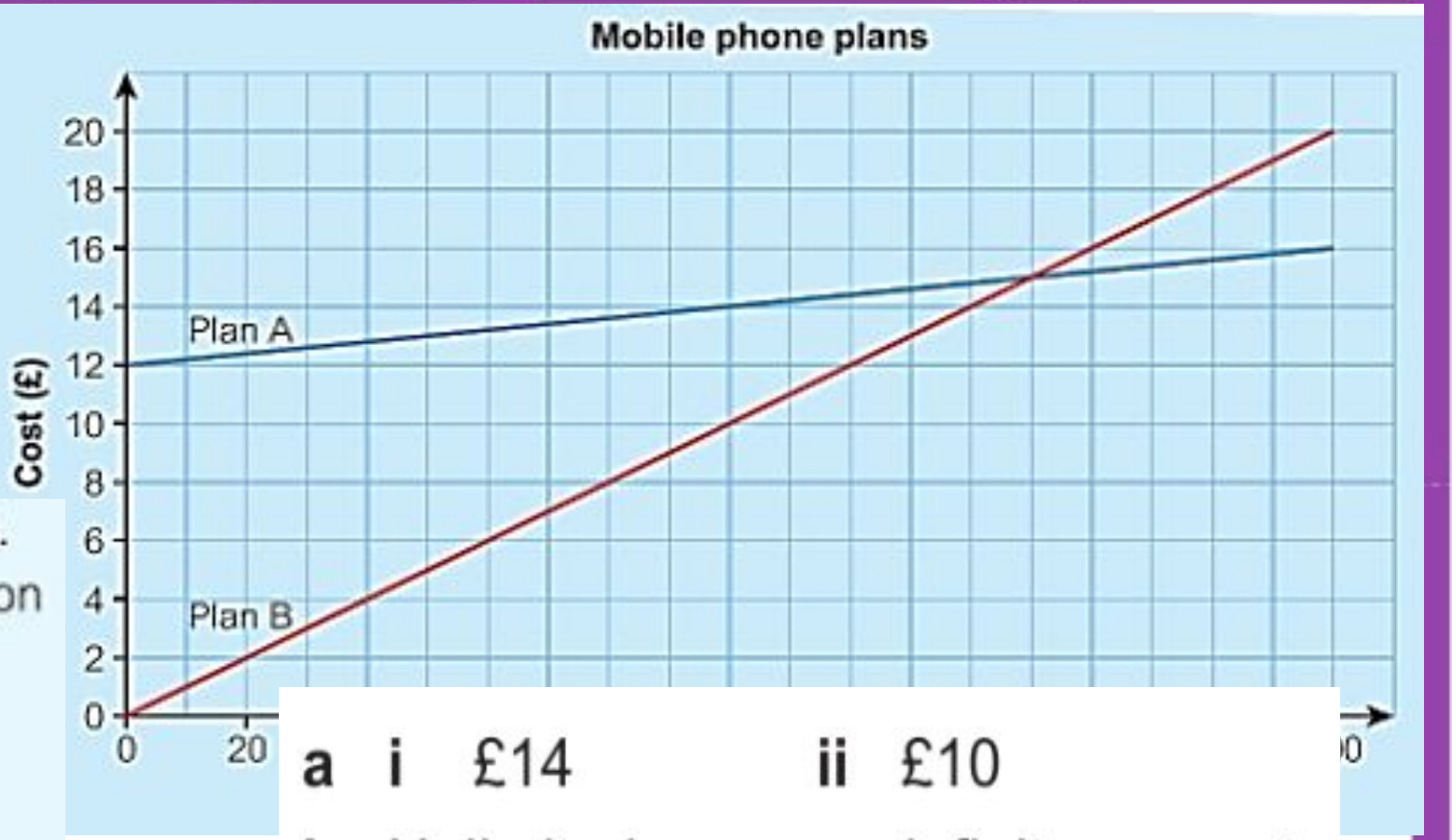
The graph shows two different phone plans.

a How much does it cost for 100 minutes on
i Plan A **ii** Plan B?

b What is the maximum amount you can pay on Plan B?

c What is the minimum amount you can pay on Plan A?

d At how many minutes is the largest difference between the cost on Plan A and B?



a **i** £14 **ii** £10

b Unlimited – pay an infinite amount.

c £12

d 0 minutes

Direct Proportional Graphs

LO: Identify a directly proportional relationship from a graph.

GCSE/iGCSE Assessment Objective Specification – Foundation/Higher

R10 solve problems involving direct and inverse proportion, including graphical and algebraic representations

R14 interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion

Mini-Plenary

LO: Identify a directly proportional relationship from a graph.

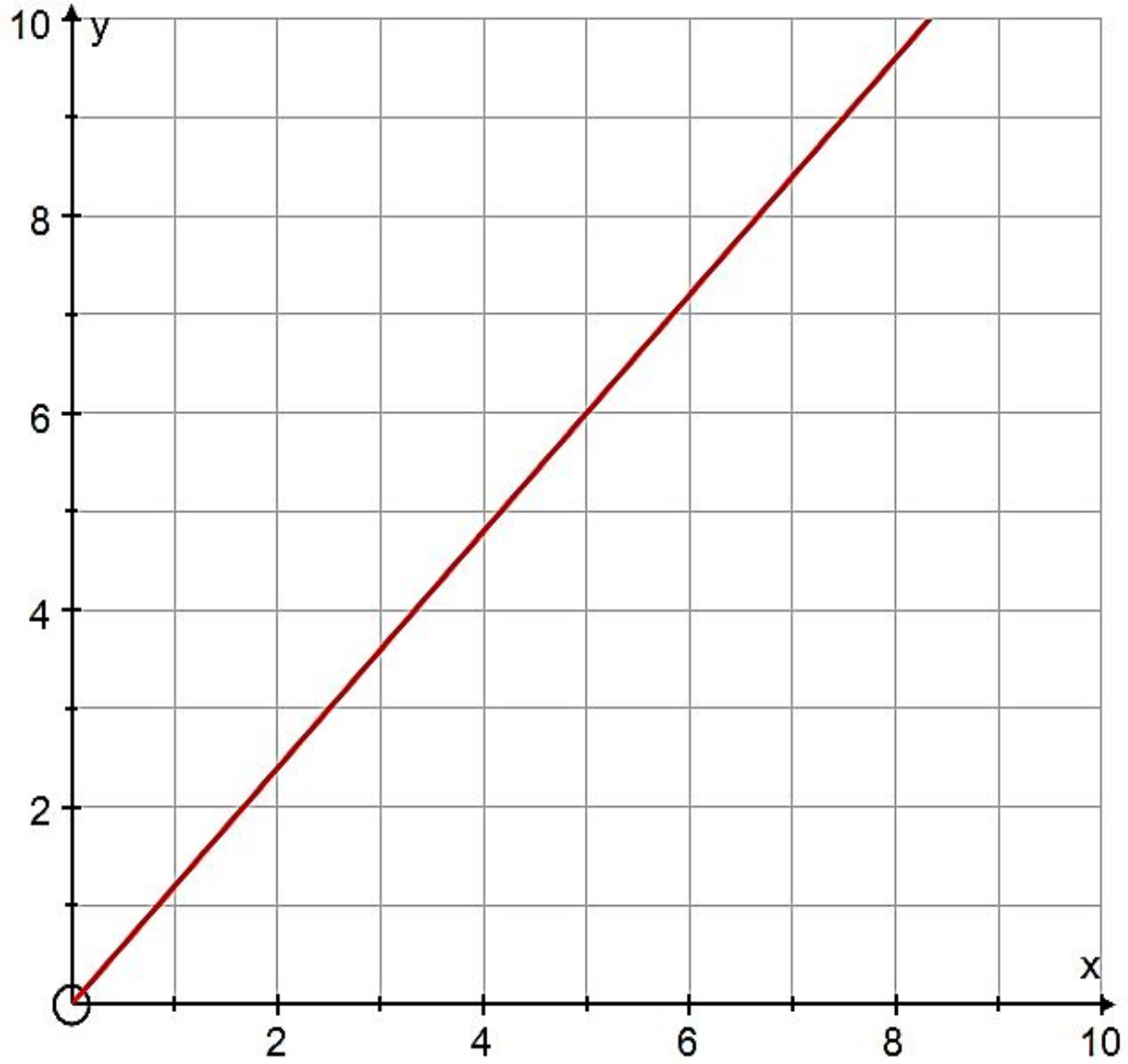
a 1 kg of apples costs £2.40. How much do $2\frac{1}{2}$ kg of apples cost?

b 500 m*l* of juice costs 60p. How much does 1.25 litres cost?

c In 2013 the exchange rate for pounds to Russian roubles was £1 = 48 roubles. How many roubles would you get for £15?

Key Concept

LO: Identify a directly proportional relationship from a graph.



Key point

When two quantities are in **direct proportion**

- plotting them as a graph gives a straight line through the origin
- when one variable is zero, the other variable will also be zero
- when one variable doubles, so does the other.

My Turn

LO: Identify a directly proportional relationship from a graph.

Real / Problem-solving This line graph shows the price of pick-and-mix sweets by mass.

a How much does 100 g of sweets cost?

b How many grams of sweets would you get for £7.50?

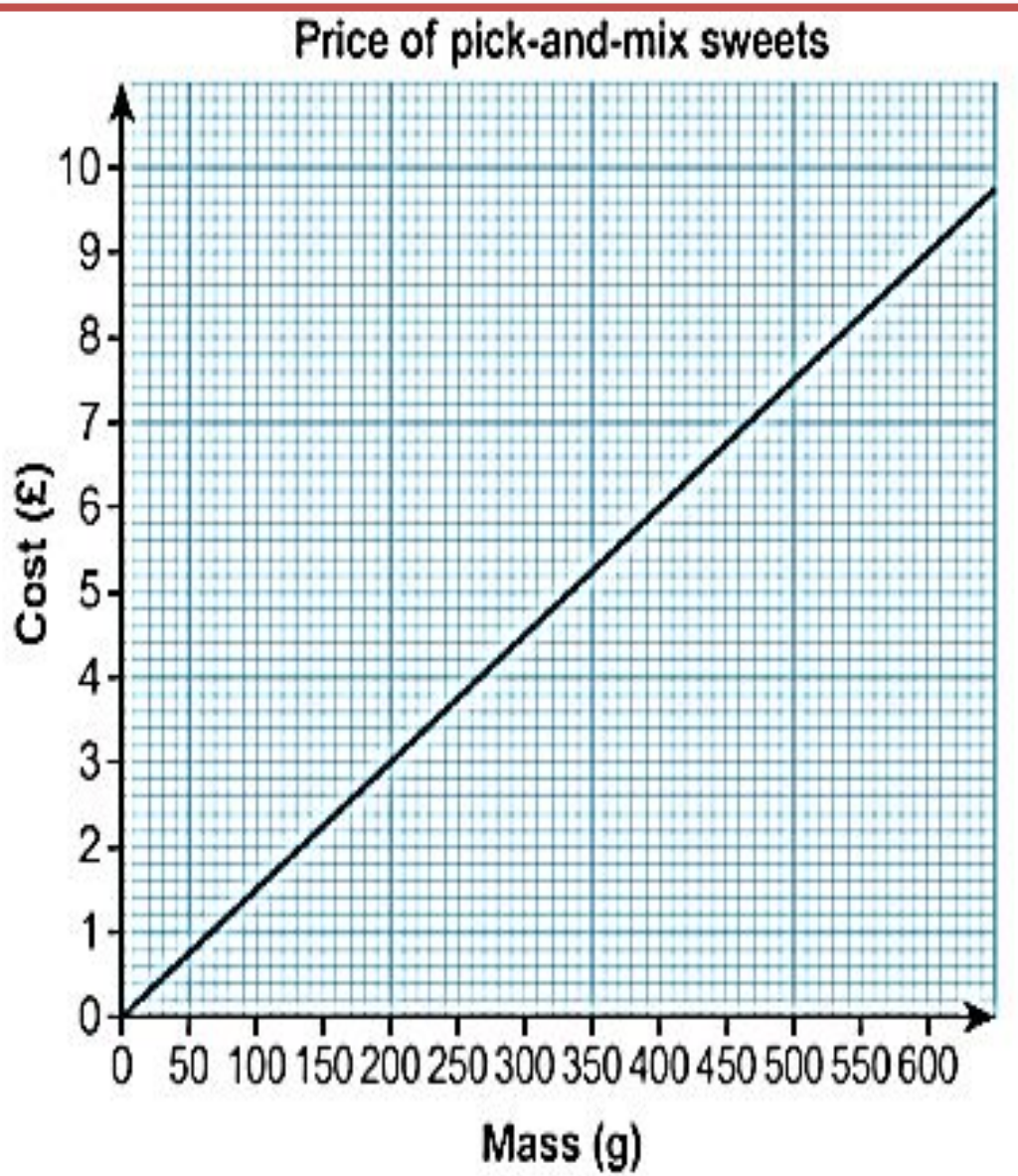
c How much does 350 g of sweets cost?

d How many grams of sweets would you get for £3.60?

e Max is having a party for 30 people. He wants to buy sweets for everyone. He buys 50 g for each person. How much does that cost him?

f How much does the price increase for every extra 100 g of sweets?

g Are the two quantities in direct proportion?



Direct Proportional Graphs

LO: Identify a directly proportional relationship from a graph.

Core Task 1:

Real / Reasoning The table shows some equivalent temperatures in Celsius and Fahrenheit.

Celsius	Fahrenheit
10°	50°
15°	59°
30°	86°

a Plot a line graph for these values.

b Are Celsius and Fahrenheit in direct proportion? Explain how you know.

c What is the freezing point of water in °F?

The Government advises elderly people to keep their living rooms at 21 °C and their bedrooms at 18 °C.

d What are these temperatures in Fahrenheit?

Core Task 2:

A car travels at a constant speed of 90 km/h.

Time (hours)	0	1	2
Distance (km)			

a Copy and complete this table for the distance travelled by the car.

b Plot this journey on a distance–time graph.

Another car travels for 1 hour at 100 km/h and then for two hours at 60 km/h.

c Show this journey on your distance–time graph.

d Which graph shows direct proportion?

Direct Proportional Graphs

LO: Identify a directly proportional relationship from a graph.

Challenge:

Real Posters are sold online for £7.50 each. The postage charge is £2.50 per order.

a Copy and complete this table for the price of buying different numbers of posters.

Number of posters	1	2	10
Price			

b Plot a line graph to show the price for 1, 2 and 10 posters including postage.

c Use your graph to work out the price of 5 posters.

d Is the price of 10 posters twice the price of 5 posters?

e Is the cost of posters as shown in this graph in direct proportion?

Direct Proportional Graphs

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R10 ✓ solve problems involving direct and inverse proportion, including graphical and algebraic representations

R14 ✓ interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion

PLENARY

LO: Identify a directly proportional relationship from a graph.

Real Which of these are in direct proportion?

A Litres and pints

B Temperature measured hourly over 24 hours

C Pounds (£) and dollars

D The distance travelled on a journey at a constant speed

E The distance travelled on a journey at varying speeds