GCSE Maths: Real-life curved graphs (Foundation): worksheet

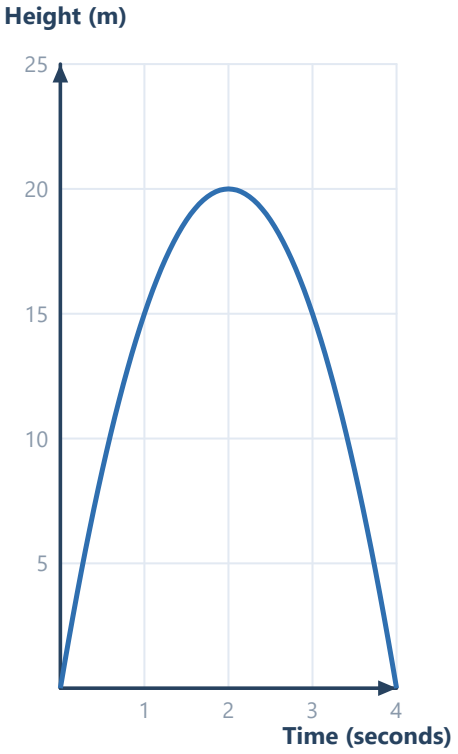
GCSE Maths - Quadratic and Other Graphs - Foundation - Lesson 13.6

Name: _____ Date: _____ Score: _____

14 questions. Write your answers in the spaces. Answers and step-by-step help are free at **websink.site/gcse/maths/ch13-quadratic-other-graphs/foundation/real-life-curved-graphs/**

Exercise 13F Real-life graphs Non-calculator

1 The graph shows the height of a ball thrown upwards, $h = 20t - 5t^2$. Use it to find



(a) the height of the ball after 1 second

Answer: .....

(b) the height of the ball after 3 seconds

Answer: .....

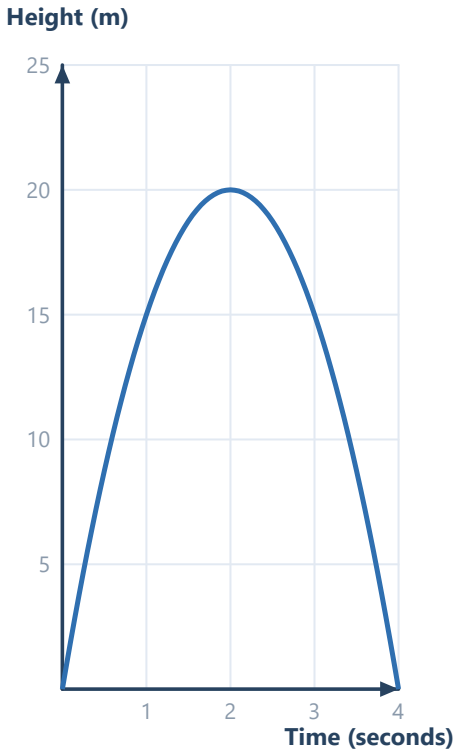
(c) the greatest height reached by the ball

Answer: .....

(d) how long the ball is in the air

Answer: .....

2 Use the ball graph to find the time(s) when the height is (a) 15 m, (b) 20 m, (c) 10 m. Give (c) to 1 decimal place.



(a) height 15 m

Answer:

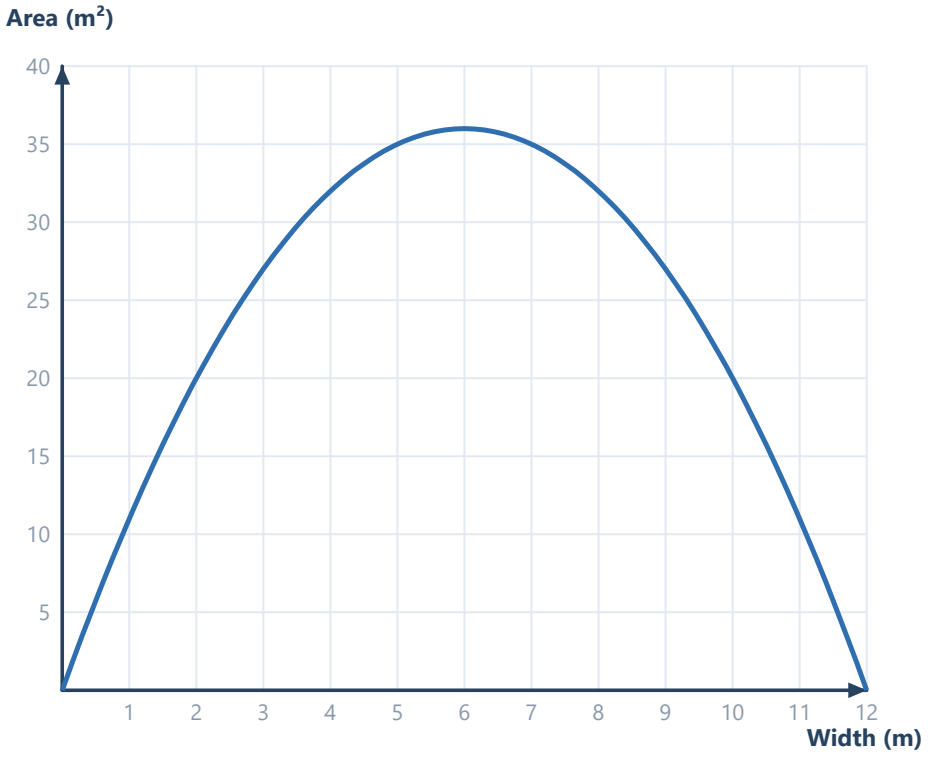
(b) height 20 m

Answer:

(c) height 10 m

Answer:

3 A farmer has 24 m of fencing for a rectangular pen against a wall. The width is x m and the area is A m^2 where $A = 12x - x^2$. Use the graph to find (a) the area when $x = 3$, (b) the largest area and the width that gives it, (c) the widths that give an area of 20 m^2.



(a) the area when x = 3

Answer:

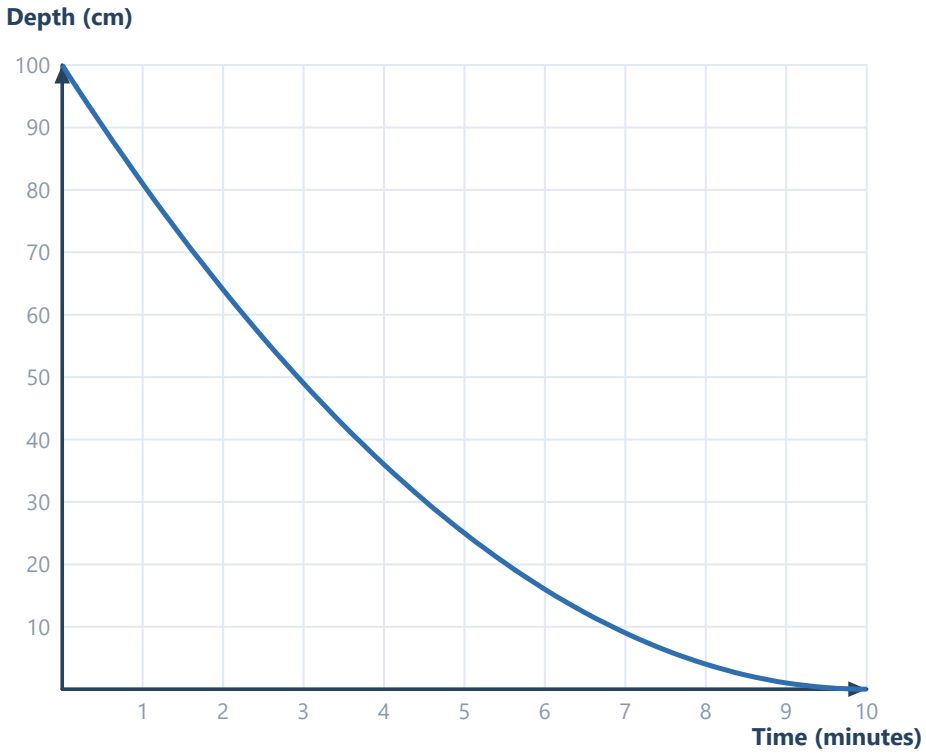
(b) the largest area

Answer:

(c) widths giving area 20 m^2

Answer:

4 **Water drains from a tank. The depth *d* cm after *t* minutes is shown on the graph. Use it to find (a) the depth after 4 minutes, (b) the depth after 2 minutes, (c) when the depth is 25 cm, (d) when the tank is empty.**



(a) the depth after 4 minutes

Answer:

(b) the depth after 2 minutes

Answer:

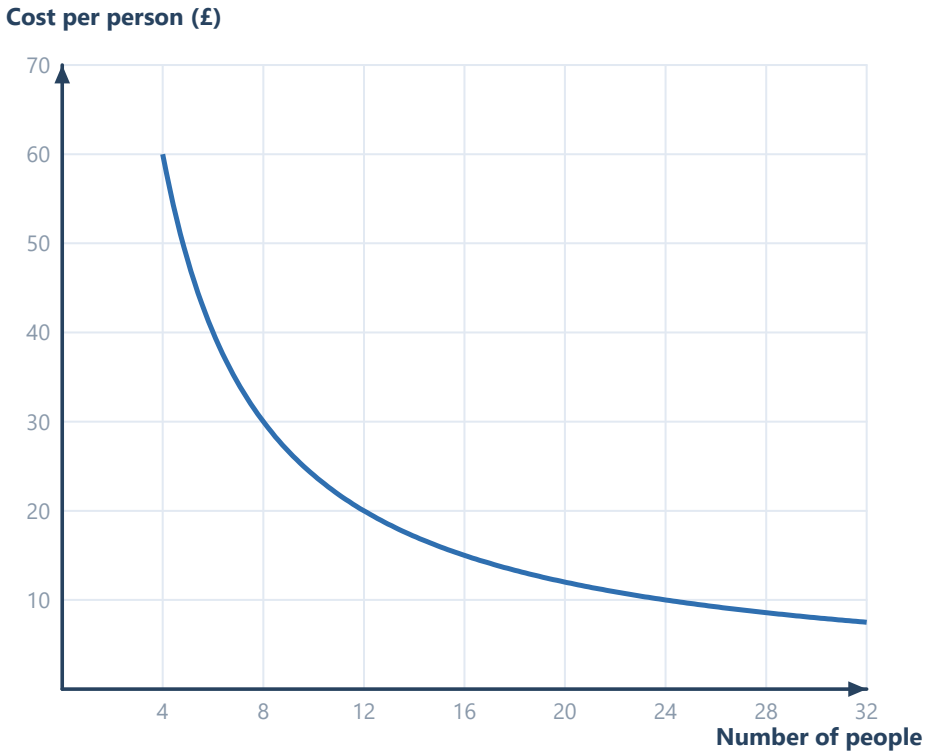
(c) when the depth is 25 cm

Answer:

(d) when the tank is empty

Answer:

5 **A coach costing £240 is shared equally between *n* people, so each pays *C* = 240 ÷ *n* pounds. Use the graph to find (a) the cost per person when 8 people go, (b) the cost per person when 15 people go, (c) the number of people if each pays £12, (d) the number if each pays £10.**



(a) 8 people

Answer:

(b) 15 people

Answer:

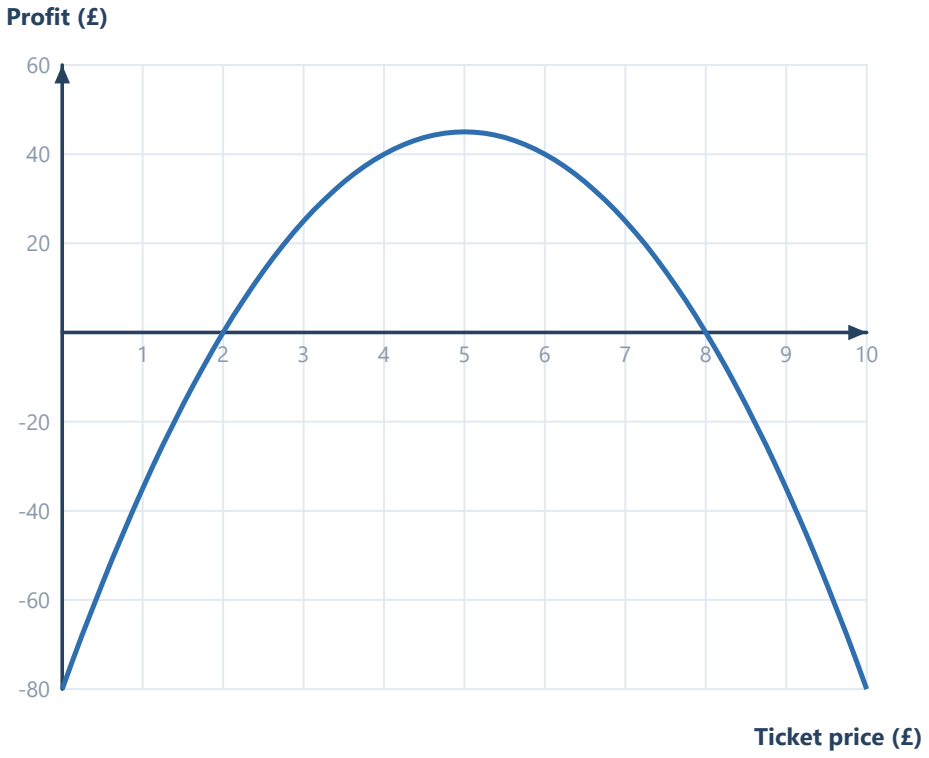
(c) each pays £12

Answer:

(d) each pays £10

Answer:

6 A school disco sells tickets at x pounds. The profit is P pounds where $P = -5x^2 + 50x - 80$. Use the graph to find (a) the profit when the ticket price is £3, (b) the ticket price that gives the greatest profit and the profit it gives, (c) the two ticket prices at which the school makes no profit (breaks even).



(a) the profit at £3

Answer:

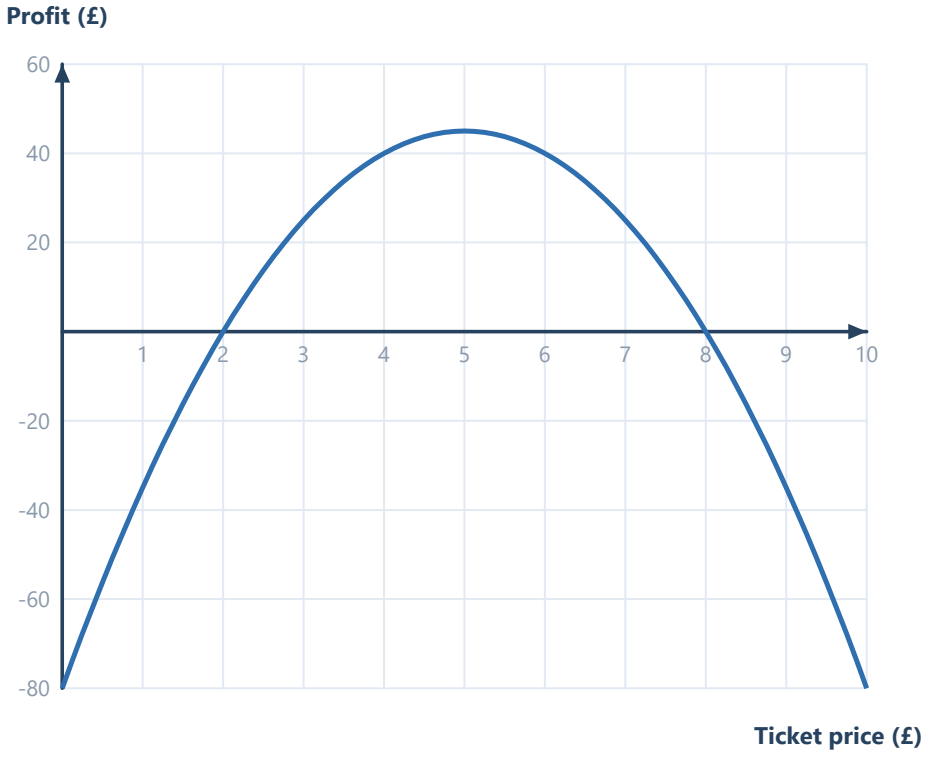
(b) the best ticket price

Answer:

(c) break-even prices

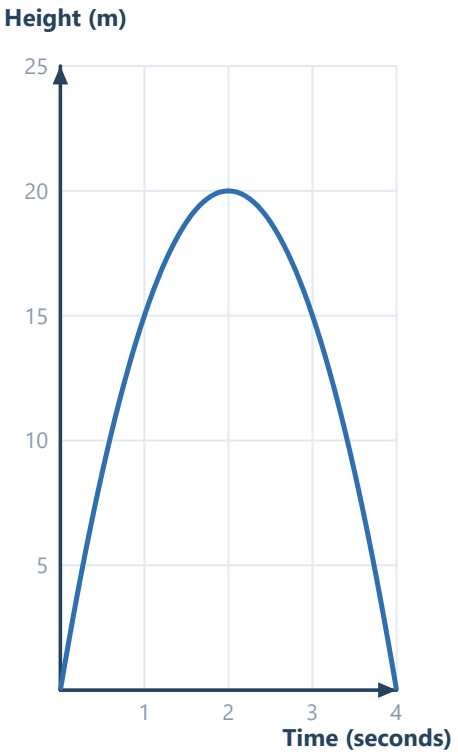
Answer:

7 **Use the profit graph (above) to find the ticket prices for which the profit is at least £40. (Find where the profit is £40 first.)**



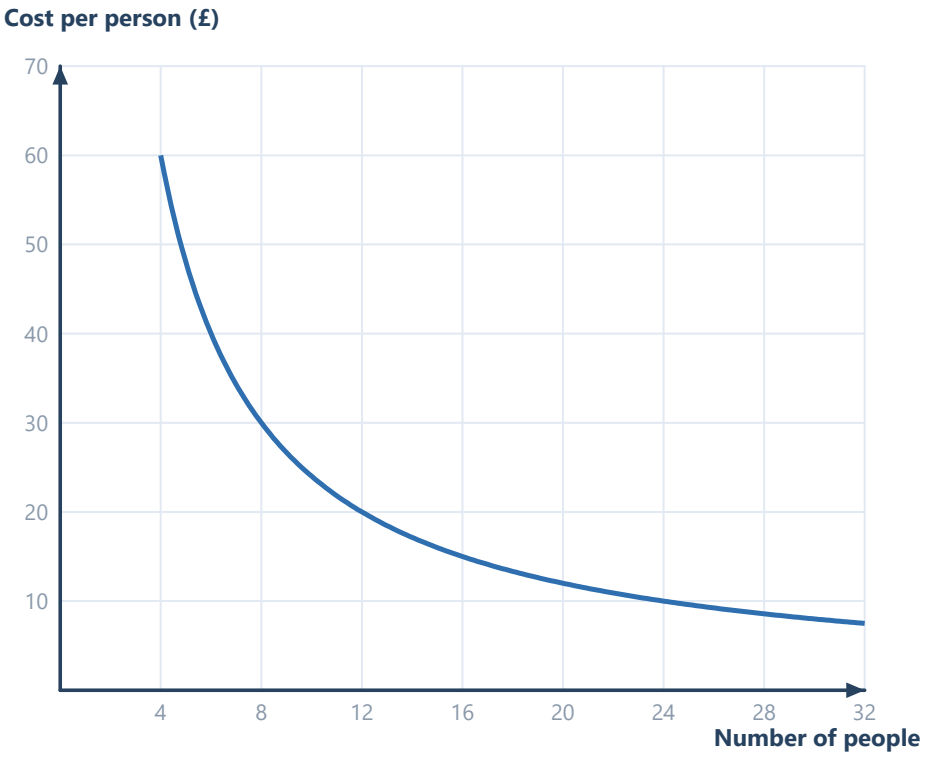
Answer:

8 Dan says that the ball is more than 18 m above the ground for more than 1 second. Use the ball graph to decide whether he is right. Give a reason.



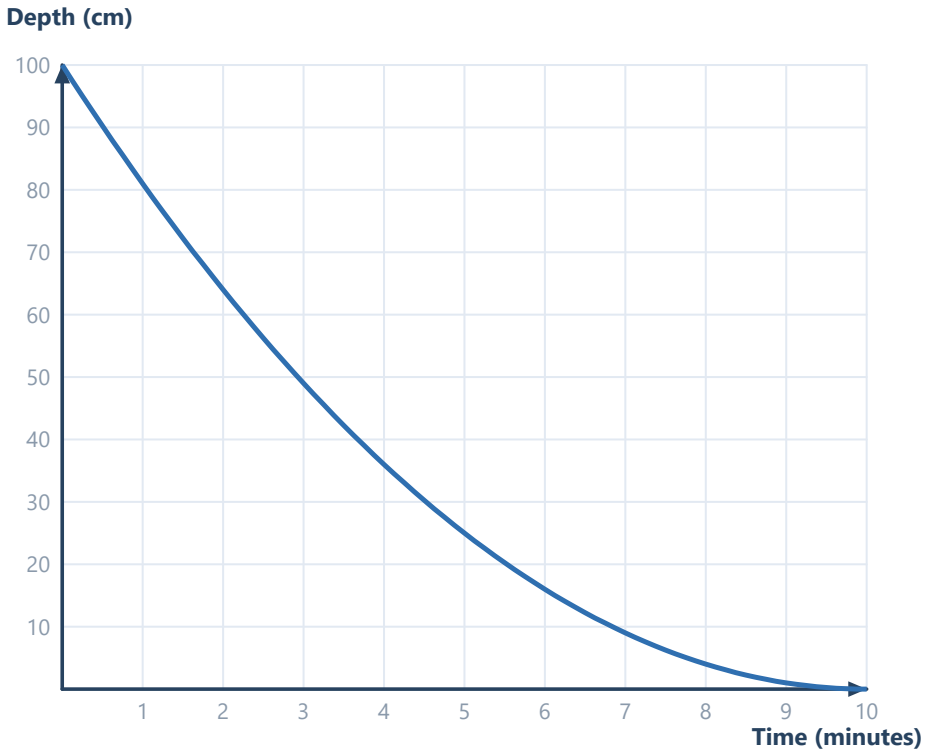
Answer:

9 Each person on the coach trip can pay at most £20. Use the graph of $C = 240 \div n$ to find the smallest number of people needed.



Answer:

10 Read from the tank graph the depth after 0 minutes and after 5 minutes. Work out the average rate at which the depth falls in the first 5 minutes, in cm per minute.



Answer:

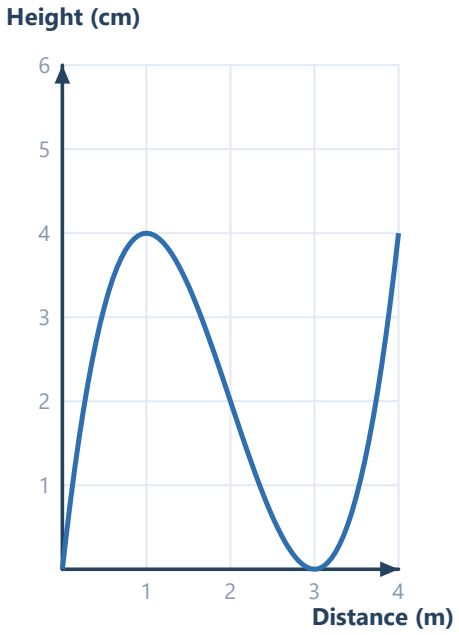
11 Sasha says: "The ball takes 2 seconds to reach its highest point, so the whole flight takes 4 seconds." Use the symmetry of the graph to explain why she is right.

Answer:

12 A student looks at the tank graph and says the water drains at a constant rate. Use values from the graph to show that this is wrong.

Answer:

13 The bumpy road profile has height h cm at distance x m, with $h = x^3 - 6x^2 + 9x$. Use the graph to find (a) the height at $x = 2$, (b) the height at $x = 4$, (c) the distances at which the height is 2 cm, to 1 decimal place.



(a) x = 2

Answer:

(b) x = 4

Answer:

(c) height 2 cm

Answer:

14 **Another ball is thrown with height $h = 30t - 5t^2$. Without drawing a graph, find (a) when it lands, (b) the time when it is at its highest, (c) the greatest height.**

(a) when it lands

Answer:

(b) time of greatest height

Answer:

(c) greatest height

Answer:

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