LCOL Basic Skills – Pack 10

Topics

Differentiation – Can I find the rate of change of a function?

Last Needed - 2022

1 ▶ 2012 LCOL Paper 1 – Question 9 (a) ☐

Complex Numbers – Can I simplify higher powers of *i*?

Last Needed – 2021

2 ▶ 2013 LCOL Sample Paper 1 – Question 3 (a) ☐

Functions – Can I find the input of a function given its output?

Last Needed - 2022

3 ▶ 2013 LCOL Sample Paper 1 – Question 7 (a) ☐

Statistics – Can I calculate the standard deviation of a set of date?

Last Needed - 2019

4 ▶ 2019 LCOL Paper 2 – Question 7 (c) (ii) ☐

Geometry – Can I use the properties of cyclic quadrilaterals to solve problems?

Last Needed - 2014

5 ▶ 2014 LCOL Sample Paper 2 – Question 6 (b) ☐

www.mathspoints.ie for **worked solutions** to these questions.

LCOL Resources by Topic

LCOL Weekly Revision

1 ▶ 2012 LCOL Paper 1 – Question 9 (a)

Investments can increase or decrease in value. The value of a particular investment of €100 was found to fit the following model:

$$V = 100 + 45t - 1.5t^2$$

where V is the value of the investment in euro, and t is the time in months after the investment was made.

(i) Find the rate at which the value of the investment was changing after 6 months.

(ii) State whether the value of the investment was increasing or decreasing after 18 months.

Justify your answer.

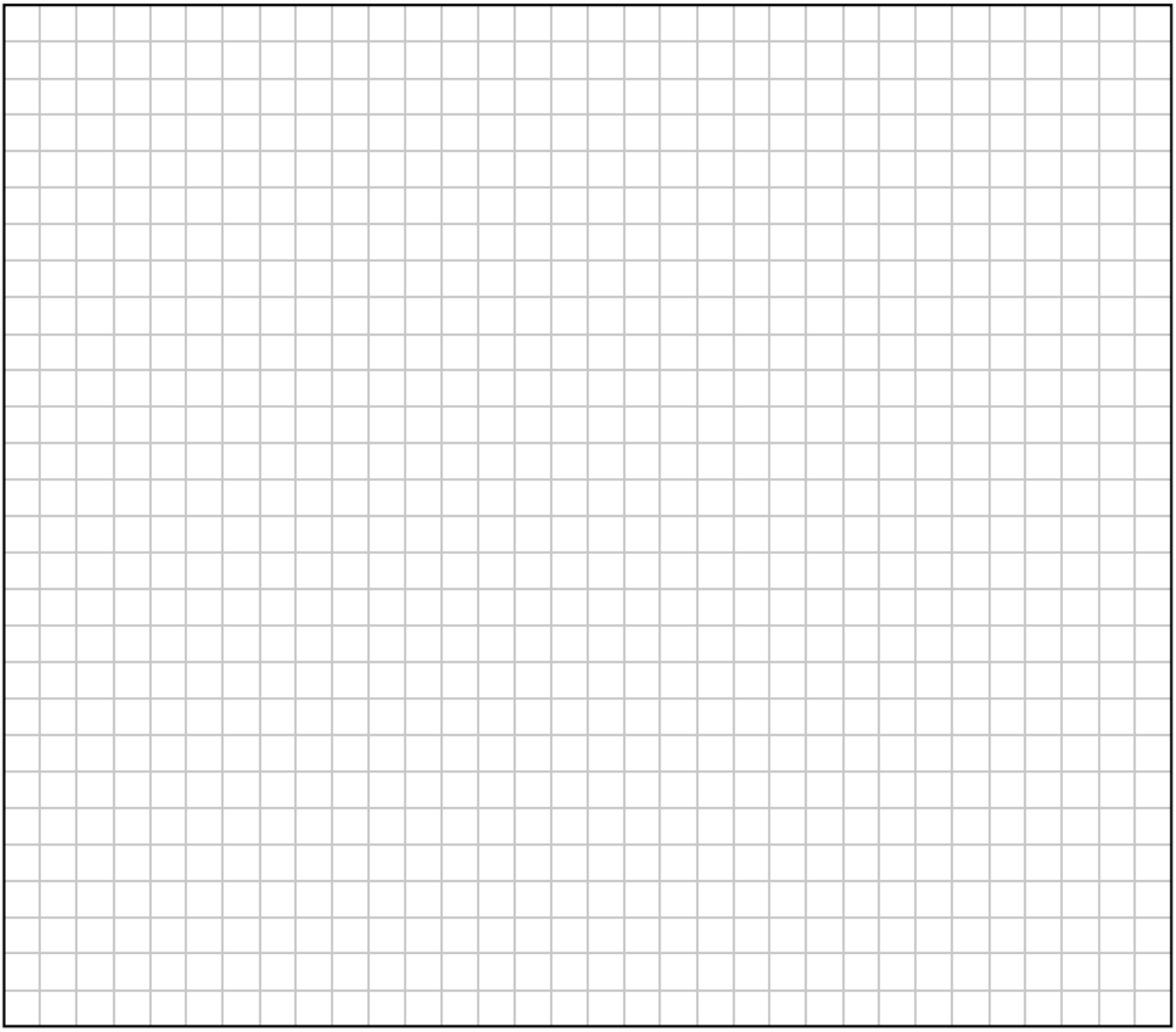
The investment was cashed in at the end of 24 months.

(iii) How much was it worth at that time?

2 ▶ 2013 LCOL Sample Paper 1 – Question 3 (a)

Write each of the following complex numbers in the form $a + bi$, where $i^2 = -1$.

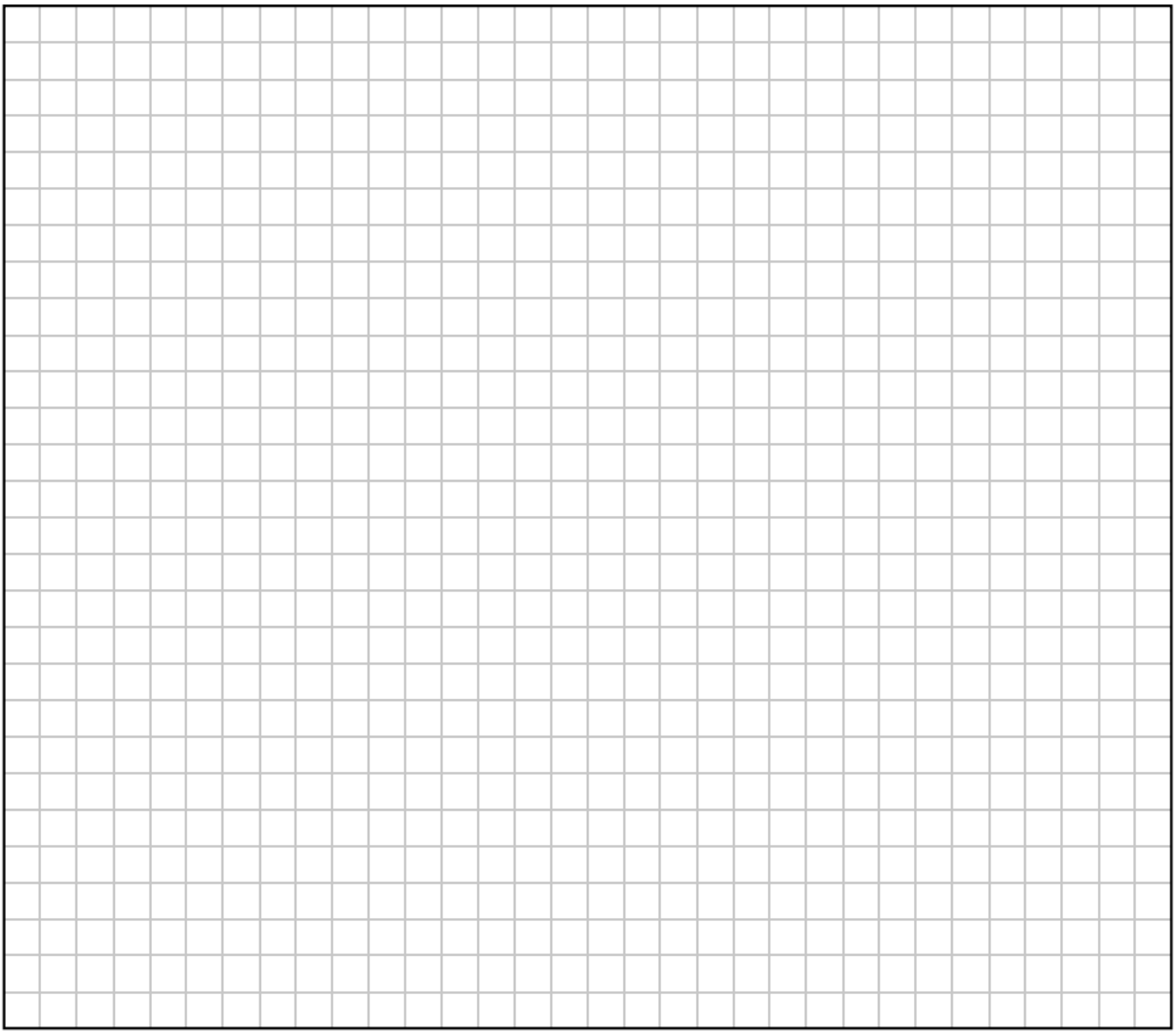
$z_4 = 1 + i + i^2 + i^3$



3 ▶ 2013 LCOL Sample Paper 1 – Question 7 (a)

Let $h(x) = x^2 + 1$, where $x \in \mathbb{R}$.

Write down a value of x for which $h(x) = 50$.



4 ▶ 2019 LCOL Paper 2 – Question 7 (c) (ii)

Table A below shows the price index for thirteen countries in four food categories for the year 2015. (*Source: Central Statistics Office*.)

It shows, for example, that if you paid €132 for meat in Austria, then the same quantity of similar meat would cost you €117 in Germany, €106 in Ireland, €63 in Lithuania and so on.

The description is the same for the other food categories.

Table A (€) (Repeat)				
Country	Meat	Fish	Milk, Cheese and Eggs	Fruits, Vegetables and Potatoes
Austria	132	125	105	125
Germany	117	109	91	111
Ireland	106	108	128	136
Lithuania	63	73	85	77
Macedonia	56	59	71	48
Netherlands	111	99	93	104
Norway	157	117	175	150
Poland	54	64	65	62
Spain	85	89	96	95
Sweden	131	115	116	137
Switzerland	254	177	148	172
Turkey	78	105	122	86
United Kingdom	112	105	118	116

Use your calculator to find the standard deviation for the data in the **Meat** category.

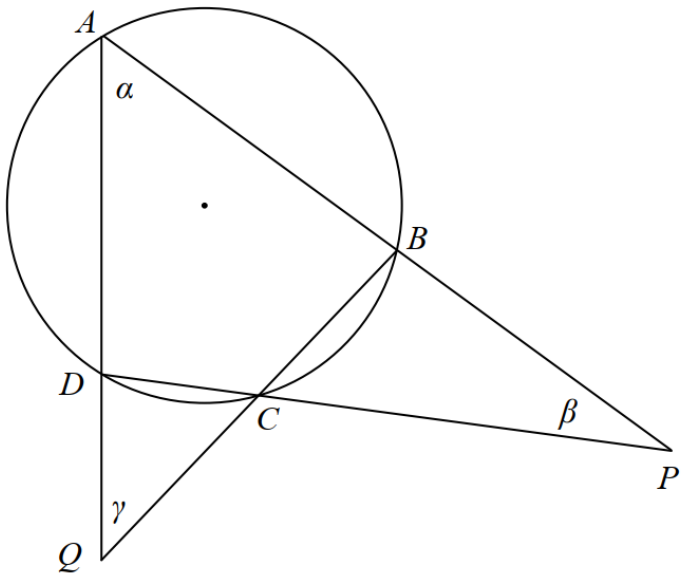
Give your answer correct to the nearest whole number.

Standard deviation:

5 ▶ 2014 LCOL Sample Paper 2 – Question 6 (b)

$ABCD$ is a cyclic quadrilateral.

The opposite sides, when extended, meet at P and Q, as shown.

The angles α, β, and γ are as shown.

Prove that $\beta + \gamma = 180° - 2\alpha$.