a)
In January 2018, an art collector bought an antique painting.
In January 2020, he sold it for £17 640.

Assume the value of the painting increased by 5% each year.

Calculate the art collector's profit.

How do we increase by 5%?	We increase by 5% by multiplying by 1.05
How would we increase by 5% each year for two years?	To increase by 5% each year for two years we would multiply by 1.05, and then by 1.05 again $\times 1.05^2$
How could we work out the purchase price of the antique painting?	$x \times 1.05^2 = £17\,640$ $x = \frac{17\,640}{1.05^2}$ $x = £16\,000$
What was the profit made on the antique painting?	£17 640 – £16 000 = £1640

b)
In January 2018, an art collector bought an antique painting.
In January 2021, he sold it for £106 480.

Assume the value of the painting increased by 10% each year.

Calculate the art collector's profit.

How do we increase by 10%?	We increase by 10% by multiplying by 1.1
How would we increase by 10% each year for three years?	To increase by 10% each year for three years we would multiply by 1.1, by 1.1 again, and then by 1.1 again $\times 1.1^3$
How could we work out the purchase price of the antique painting?	$x \times 1.1^3 = £106\,480$ $x = \frac{106\,480}{1.1^3}$ $x = £80\,000$
What was the profit made on the antique painting?	

c)
In January 2018, an art collector bought an antique painting.
In January 2020, he sold it for £21 660.

Assume the value of the painting decreased by 5% each year.

Calculate the art collector's loss.

How do we decrease by 5%?	We decrease by 5% by multiplying by 0.95
How would we decrease by 5% each year for two years?	To decrease by 5% each year for two years we would multiply by 0.95, and then by 0.95 again $\times 0.95^2$
How could we work out the purchase price of the antique painting?	
What was the loss made on the antique painting?	

d)
In January 2018, an art collector bought an antique painting.
In January 2020, he sold it for £13 365.

Assume the value of the painting increased by 10% in the first year, and then decreased by 10% in the second year.

Calculate the art collector's loss.