

## 3.4) Histograms

## Worked example

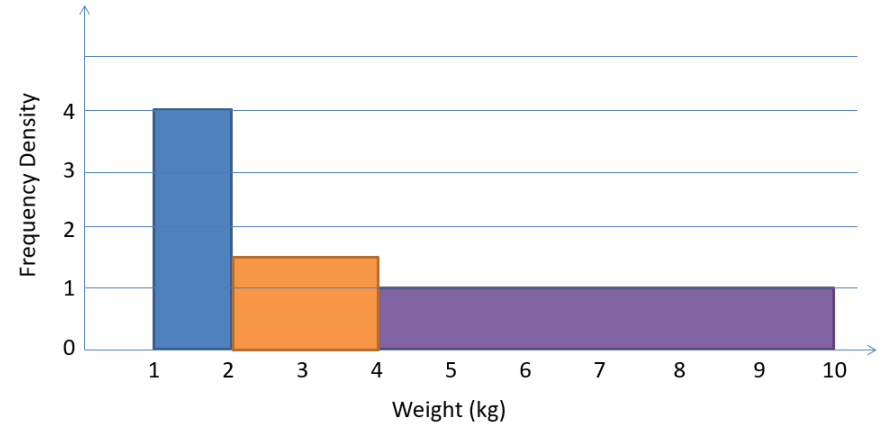
Plot a histogram for the data:

Height, $h$ (nearest cm)	Frequency
$1 < h \leq 5$	5
$5 < h \leq 8$	4
$8 < h \leq 9$	3

## Your turn

Plot a histogram for the data:

Weight, $w$ (nearest kg)	Frequency
$1 \leq w < 2$	4
$2 \leq w < 4$	3
$4 \leq w < 9$	5



## Worked example

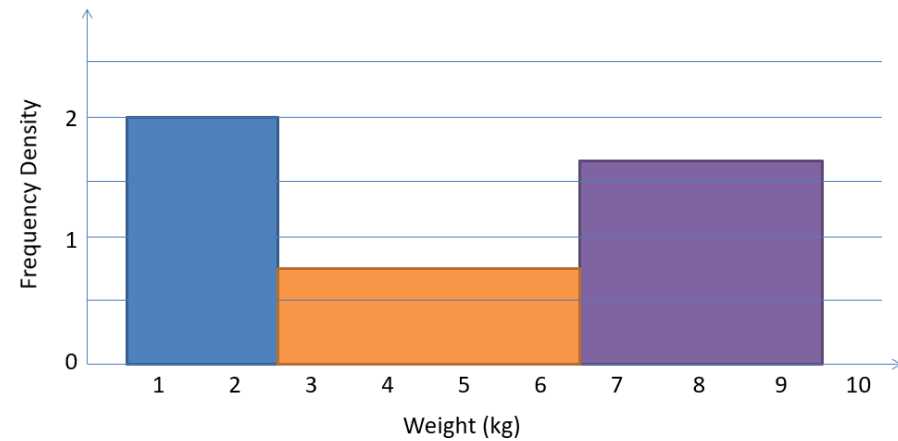
Plot a histogram for the data:

Height (nearest cm)	Frequency
1-4	5
5-7	4
8-9	3

## Your turn

Plot a histogram for the data:

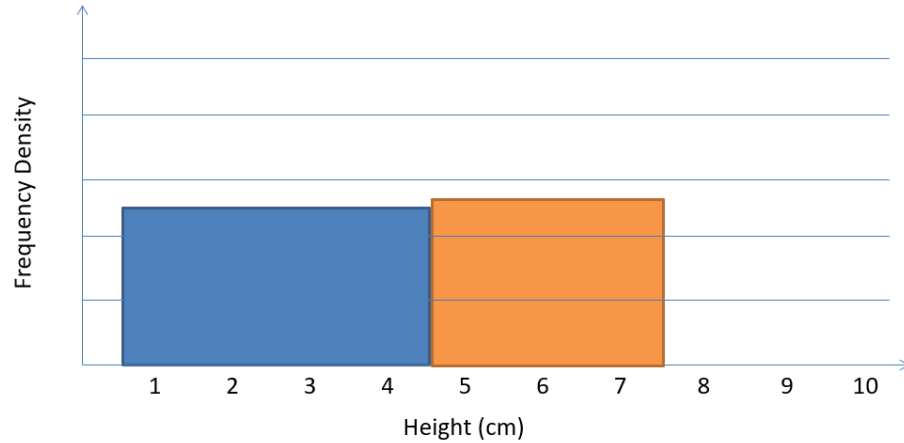
Weight (nearest kg)	Frequency
1-2	4
3-6	3
7-9	5



# Worked example

Complete the table and histogram:

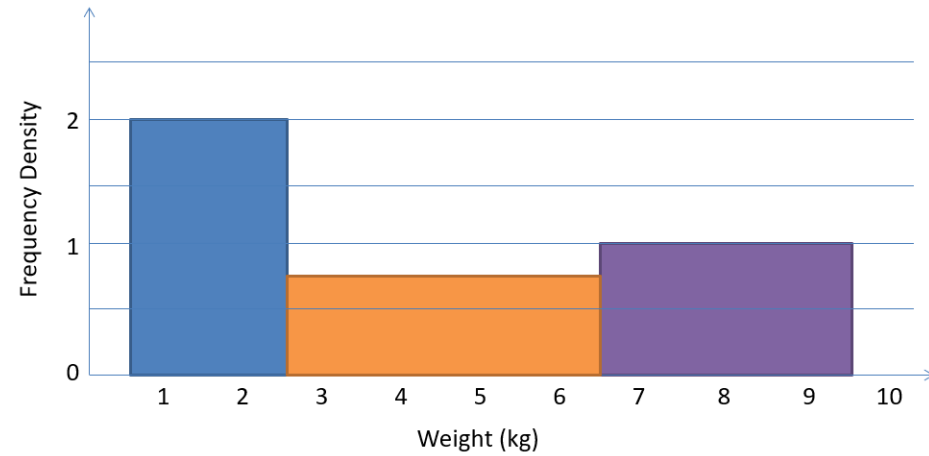
Height (nearest cm)	Frequency
1-4	
5-7	4
8-9	3



# Your turn

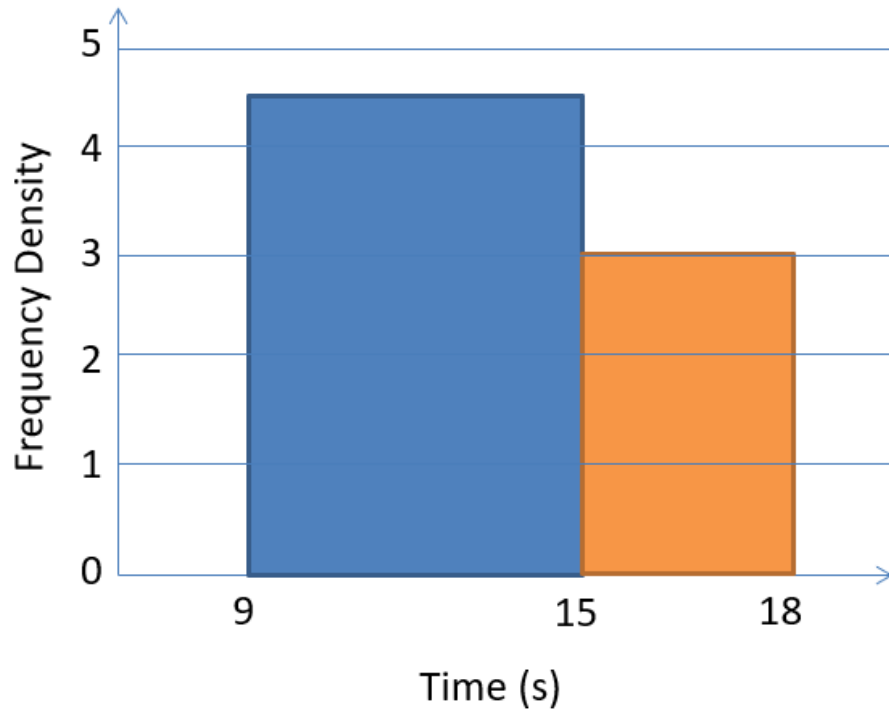
Complete the table and histogram:

Weight (nearest kg)	Frequency
1-2	4
3-6	<del>3</del>
7-9	



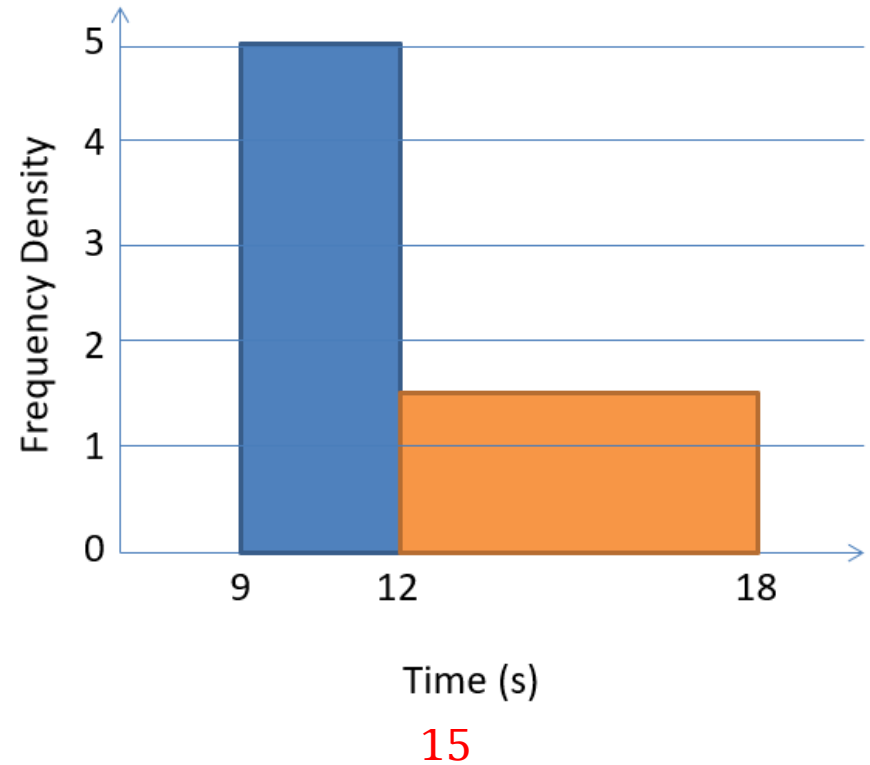
## Worked example

There were 54 runners in a 100m race.  
The following histogram represents their times.  
Determine the number of runners with times below 13 seconds.



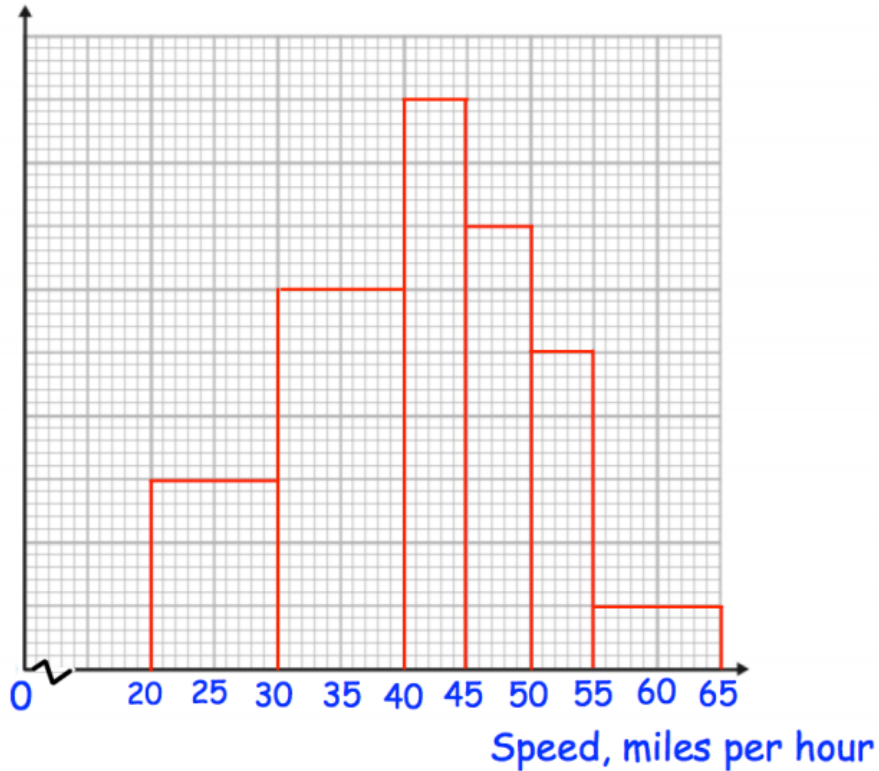
## Your turn

There were 60 runners in a 100m race.  
The following histogram represents their times.  
Determine the number of runners with times above 14 seconds.



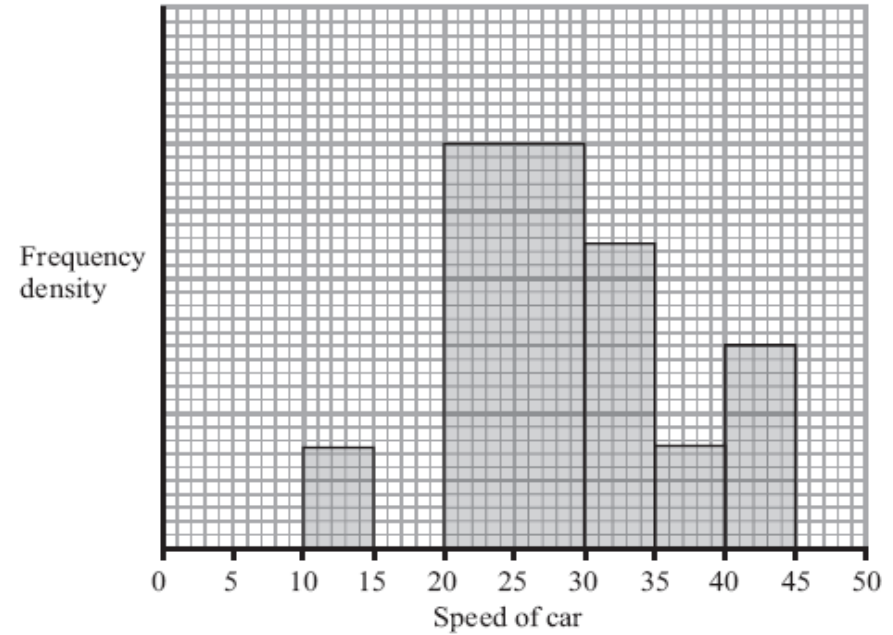
## Worked example

The histogram shows the speeds of 82 cars. Calculate the number of cars that were driving at speeds of at least 50 miles per hour.



## Your turn

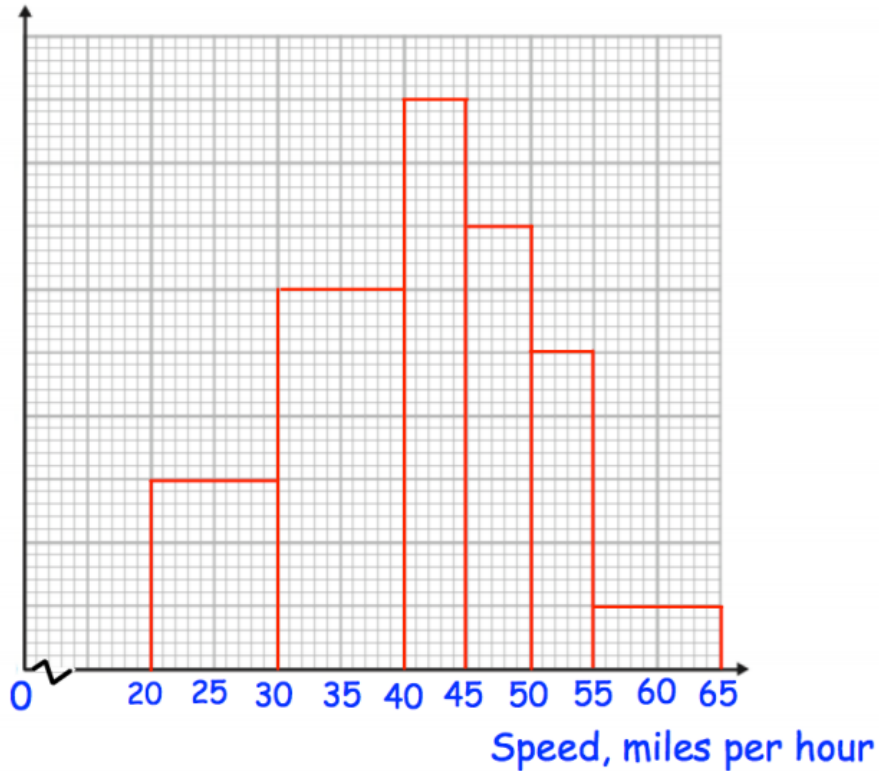
The histogram shows the speeds of 450 cars. Calculate the number of cars that were driving at speeds of at least 35 miles per hour.



90

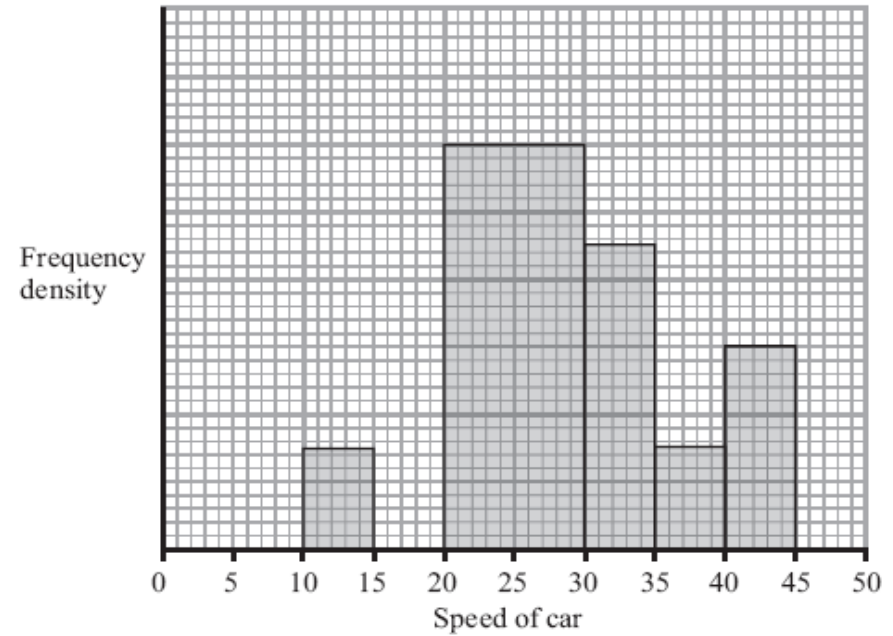
## Worked example

The histogram shows the speeds of 82 cars.  
Estimate the mean speed.



## Your turn

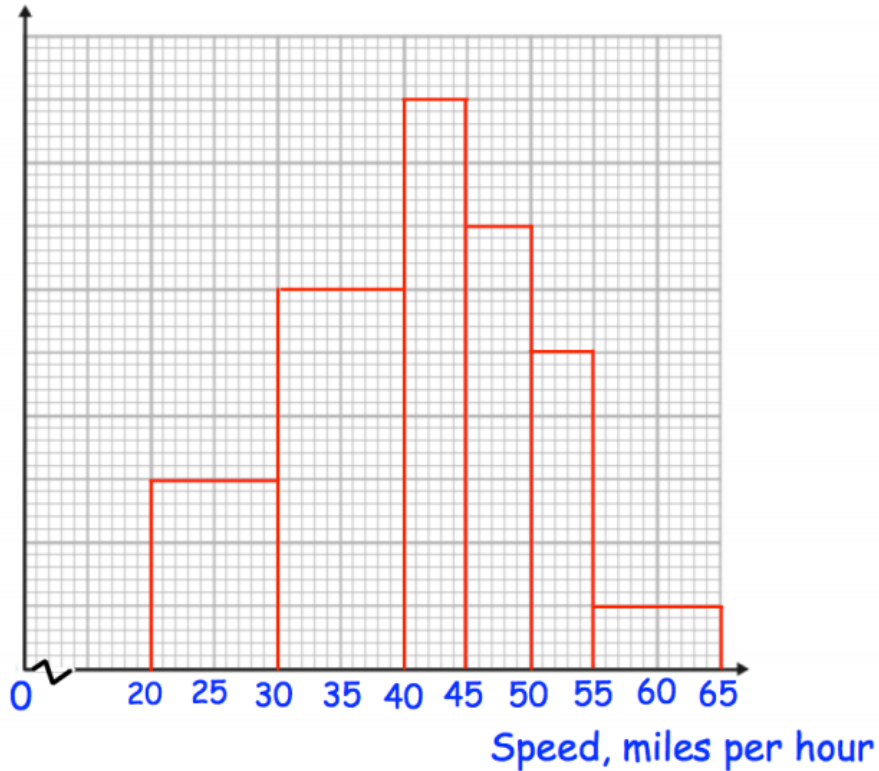
The histogram shows the speeds of 450 cars.  
Estimate the mean speed.



28.8 mph

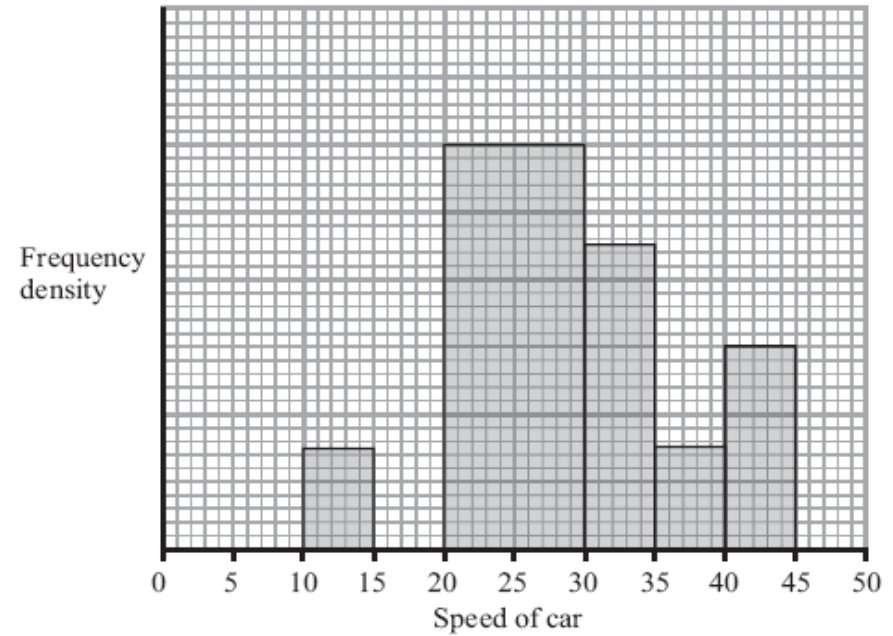
## Worked example

The histogram shows the speeds of 82 cars.  
Estimate the median speed



## Your turn

The histogram shows the speeds of 450 cars.  
Estimate the median speed



28.1 mph (3 sf)



## Worked example

The frequency table shows some running times. On a histogram the bar for 0-2 seconds is drawn with width 8cm and height 12cm.

Find the width and height of the bar for 2-6 seconds.

Time (seconds)	Frequency
$0 \leq t < 2$	12
$2 \leq t < 6$	3

## Your turn

The frequency table shows some running times. On a histogram the bar for 0-4 seconds is drawn with width 6cm and height 8cm. Find the width and height of the bar for 4-6 seconds.

Time (seconds)	Frequency
$0 \leq t < 4$	8
$4 \leq t < 6$	9

Width = 3 cm  
Height = 18 cm

## Worked example

The variable  $x$  was measured to the nearest whole number.

On a histogram the bar representing the  $2 - 7$  class has a width of 4 cm and a height of 12 cm.  
Find the width and height of the  $8 - 10$  class

$x$	Frequency
$2 - 7$	18
$8 - 10$	6
$12 -$	4

## Your turn

The variable  $x$  was measured to the nearest whole number.

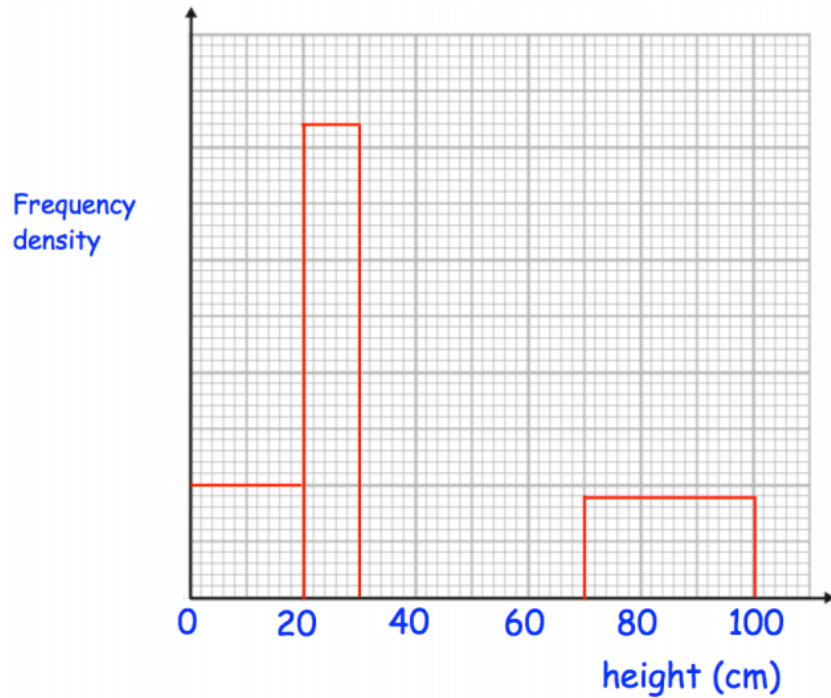
On a histogram the bar representing the  $10 - 15$  class has a width of 2 cm and a height of 5 cm.  
Find the width and height of the  $16 - 18$  class

$x$	Frequency
$10 - 15$	15
$16 - 18$	9
$19 -$	16

Width = 1 cm  
Height = 6 cm

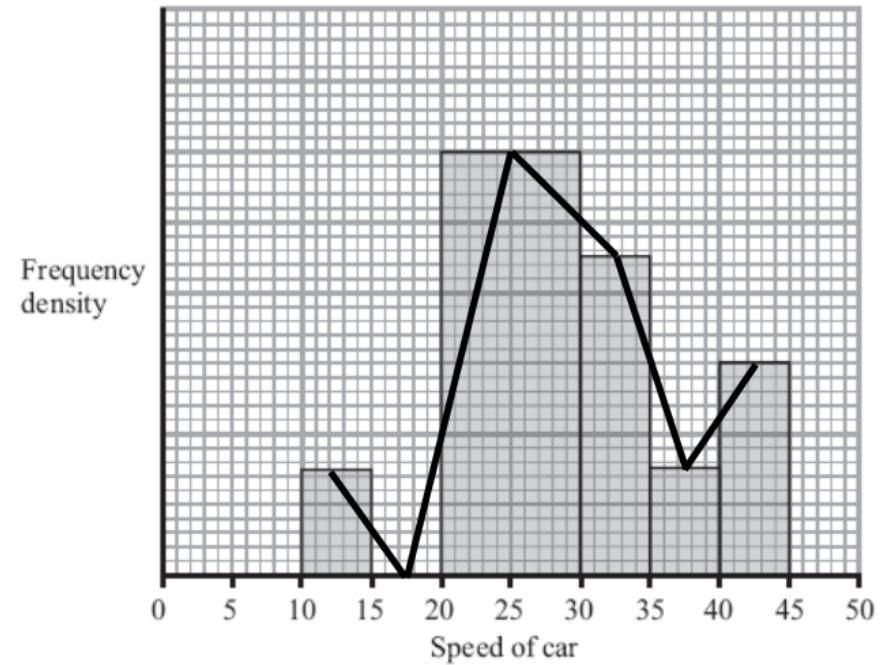
# Worked example

Draw a frequency polygon.



# Your turn

Draw a frequency polygon.



# Worked example

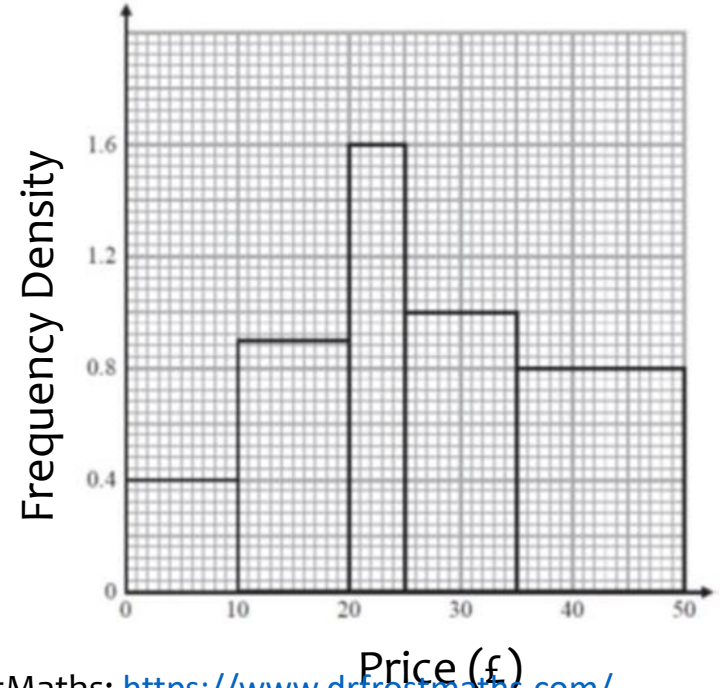
# Your turn

Plot a histogram

Height, $x$ (cm)	Frequency
$140 < x \leq 155$	6
$155 < x \leq 175$	14
$175 < x \leq 185$	6
$185 < x \leq 190$	21

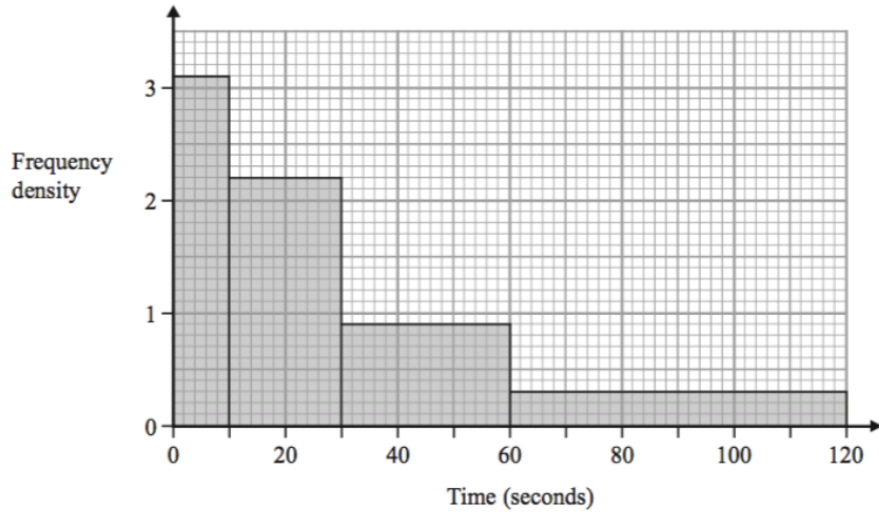
Plot a histogram

Price, $y$ (£)	Frequency
$0 < y \leq 10$	4
$10 < y \leq 20$	9
$20 < y \leq 25$	8
$25 < y \leq 35$	10
$35 < y \leq 50$	12



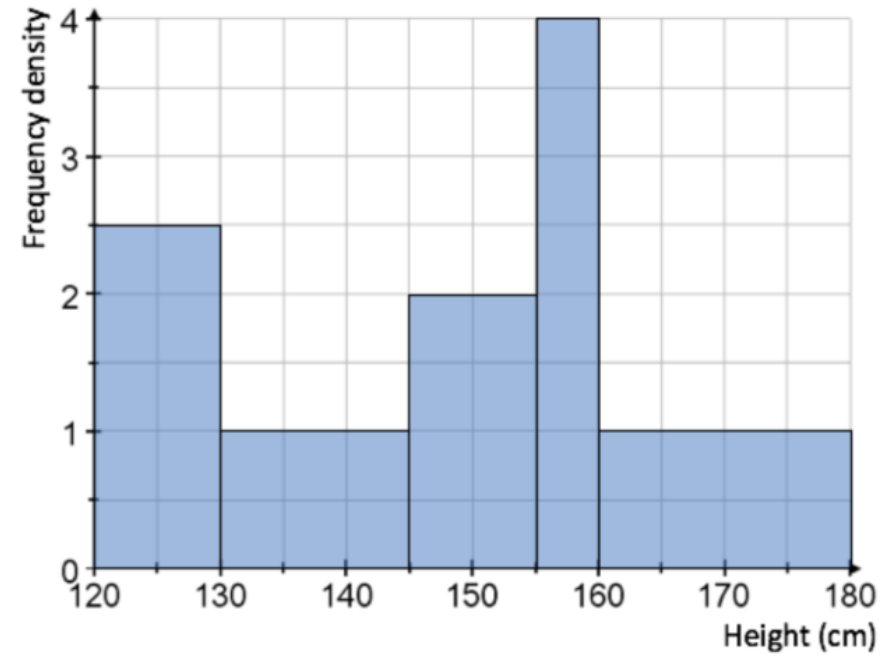
# Worked example

Draw a frequency table from the histogram



# Your turn

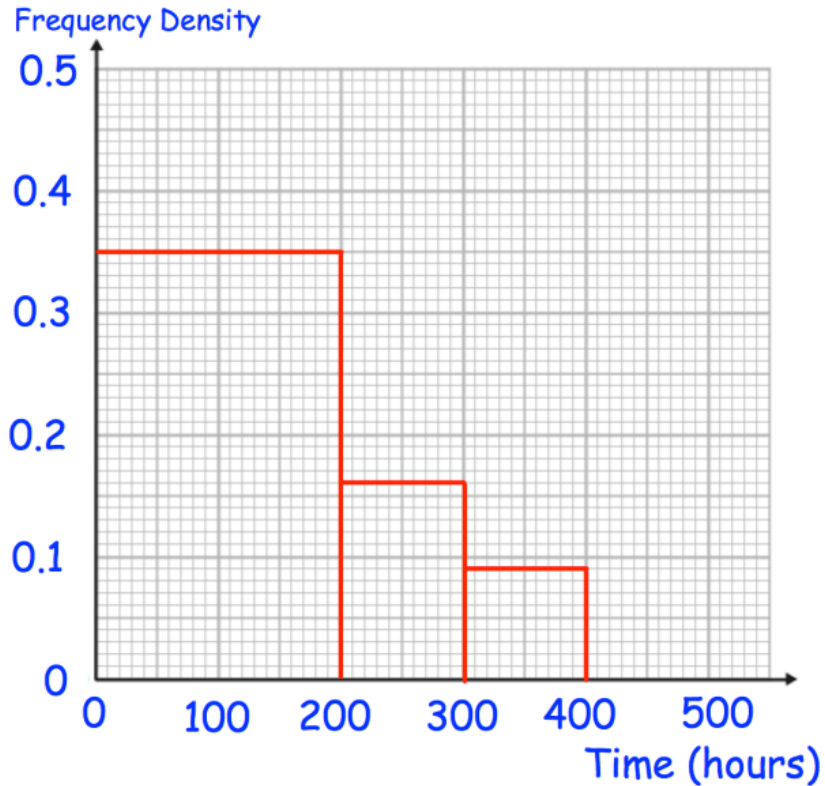
Draw a frequency table from the histogram



Height, $y$ (cm)	Frequency
$120 < y \leq 130$	25
$130 < y \leq 145$	15
$145 < y \leq 155$	20
$155 < y \leq 160$	20
$160 < y \leq 180$	20

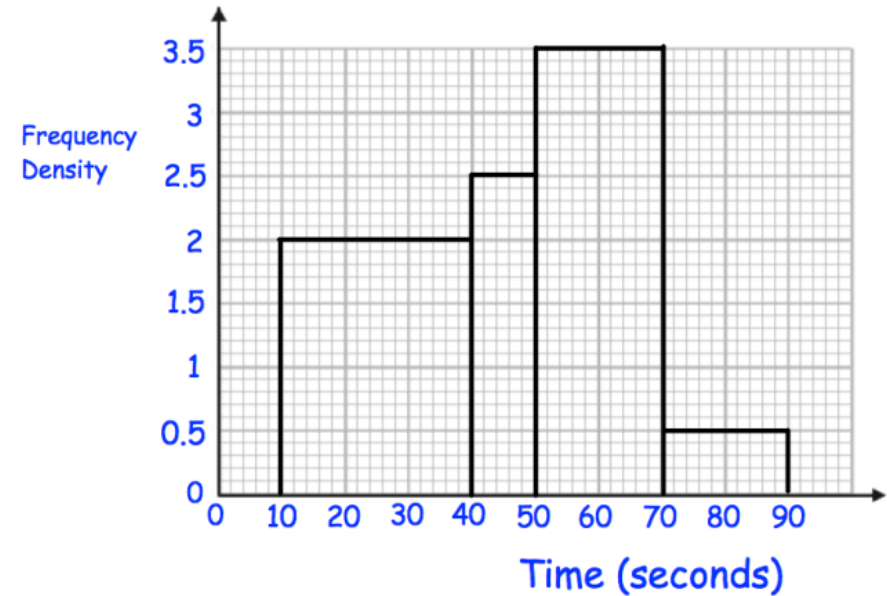
## Worked example

Estimate the number of pilots who have flown under 350 hours.



## Your turn

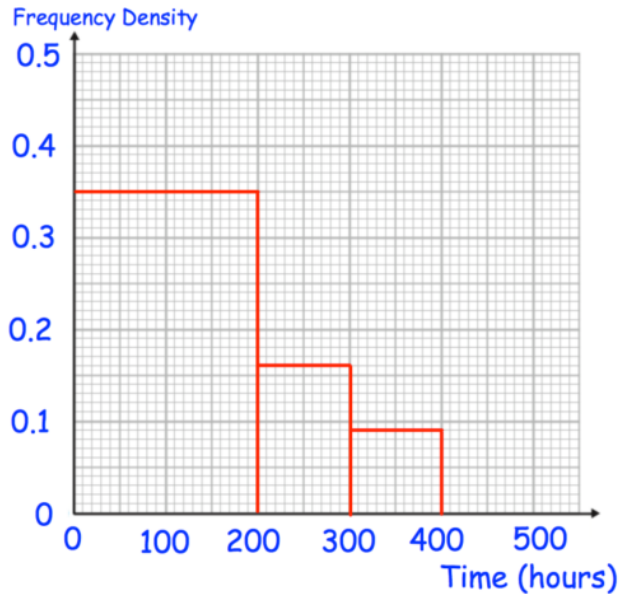
Estimate the number of students who took less than 60 seconds to complete the puzzle



120

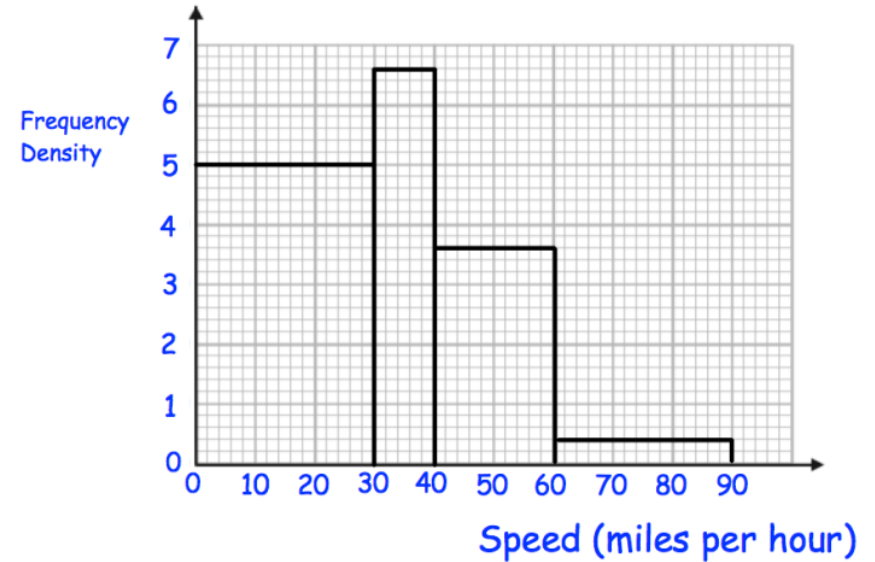
## Worked example

Work out the percentage of pilots who have flown under 250 hours.



## Your turn

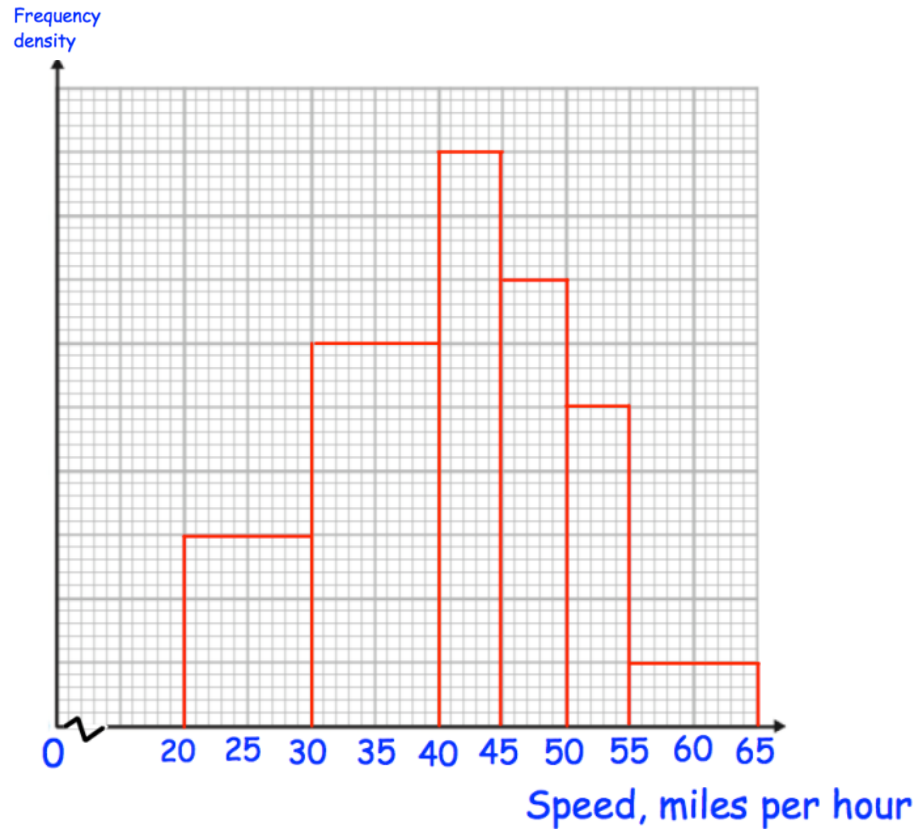
Work out the percentage of cars that were under the speed limit of 60 *mph*



96%

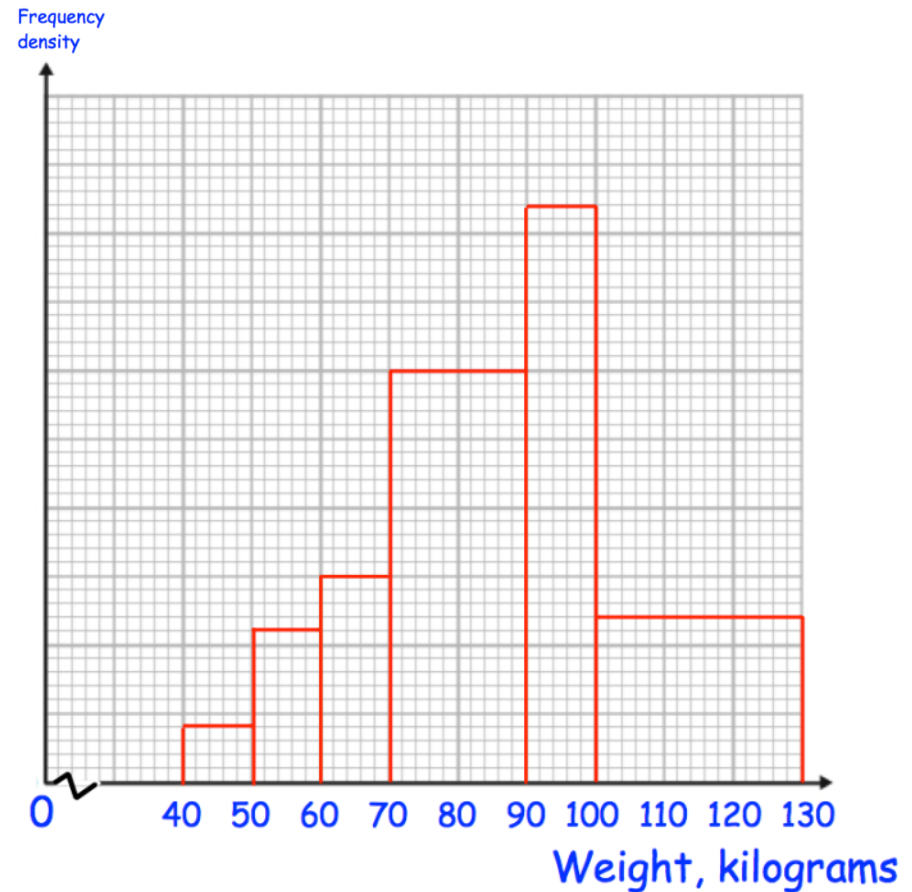
## Worked example

There were 82 cars on the road.  
14 cars were travelling over 50 *mph*.  
Estimate the number of cars that were travelling  
between 40 and 49 *mph*.



## Your turn

There were 504 athletes measured.  
45 athletes weigh under 60 *kg*.  
Estimate the number of athletes between 70 and  
95 *kg*.



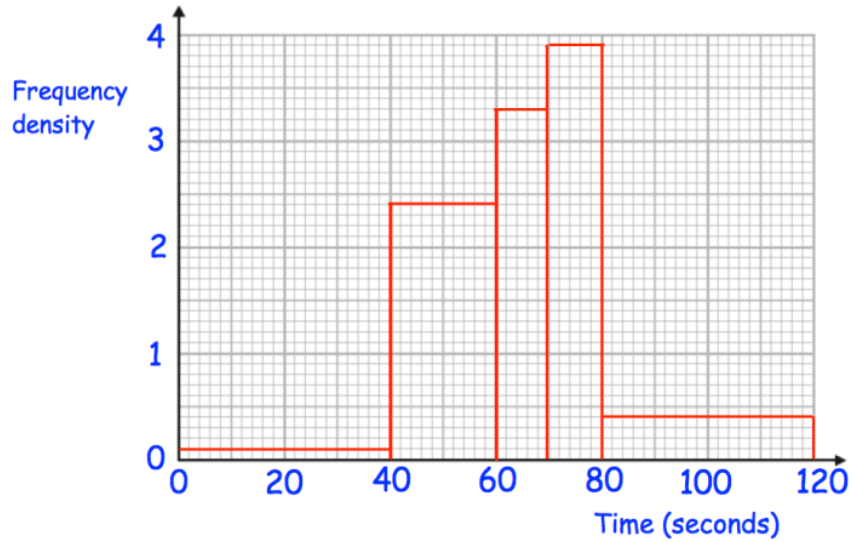
243



# Worked example

# Your turn

Estimate the median time



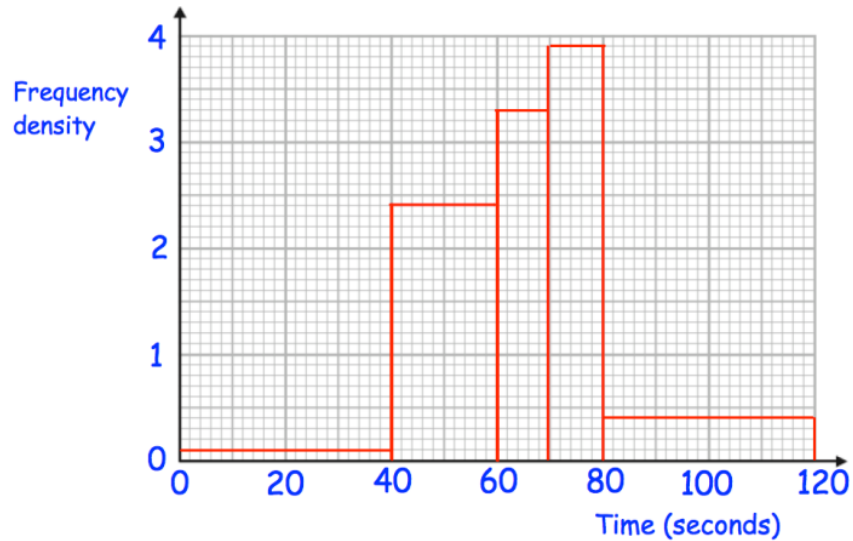
Estimate the median weight



14.84 (2 dp)

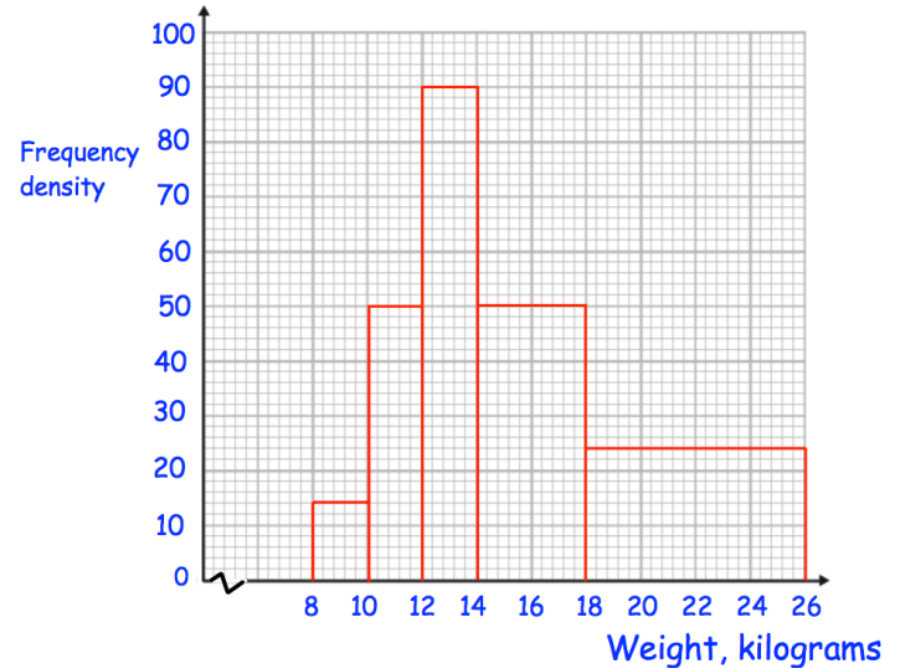
## Worked example

A participant is chosen at random.  
What is the probability they took longer than 60 seconds?



## Your turn

A participant is chosen at random.  
What is the probability they weigh more than 14 kg?



$$\frac{14}{25} = 0.56$$