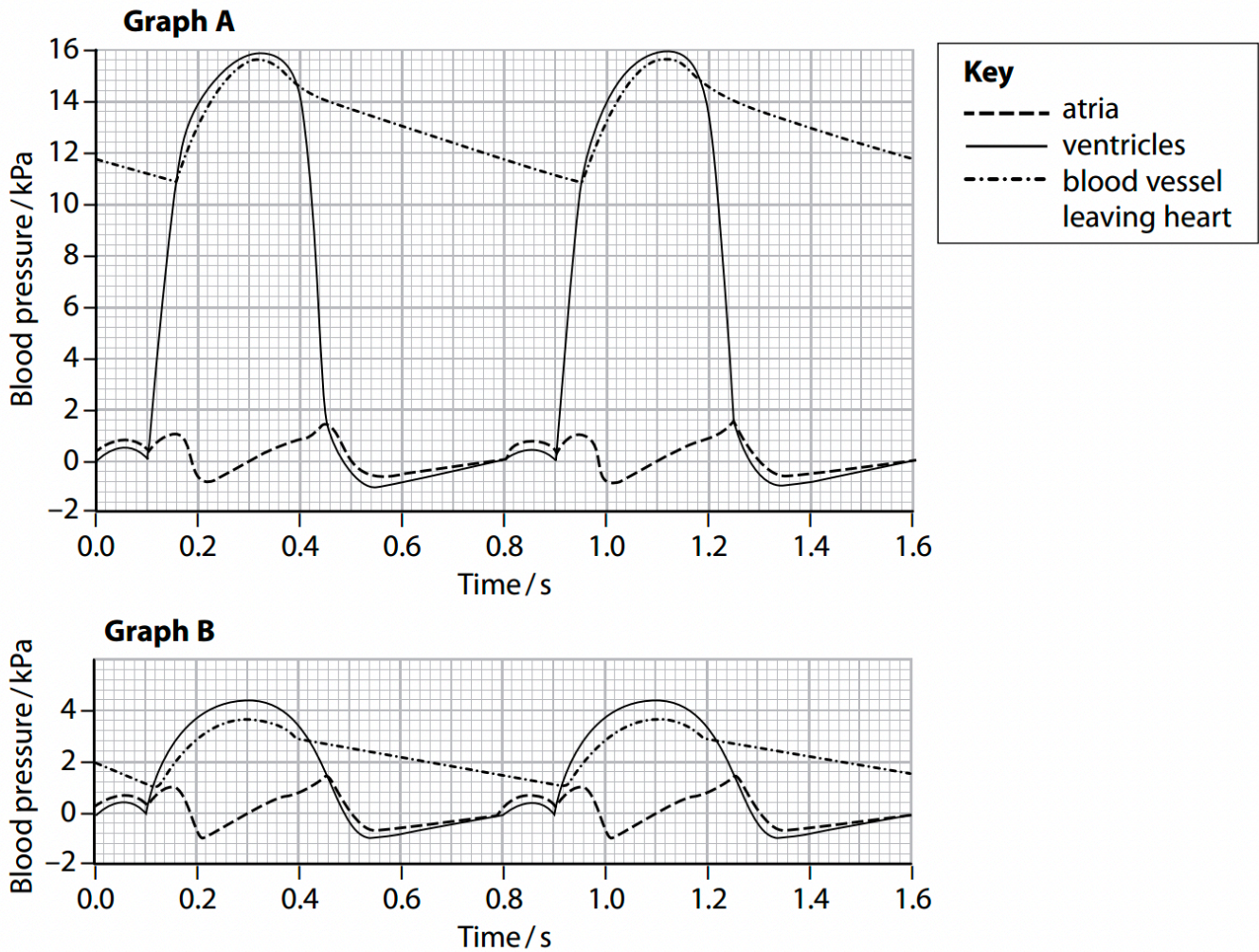




5 The pressure of the blood passing through the heart can vary.

Graph A shows the changes in blood pressure in one side of the heart. Graph B shows the changes in blood pressure in the other side of the heart over the same time period.



(a) (i) Calculate the heart rate.

(2)

Answer



16 (a) Fig. 16 shows pressure changes during the cardiac cycle.

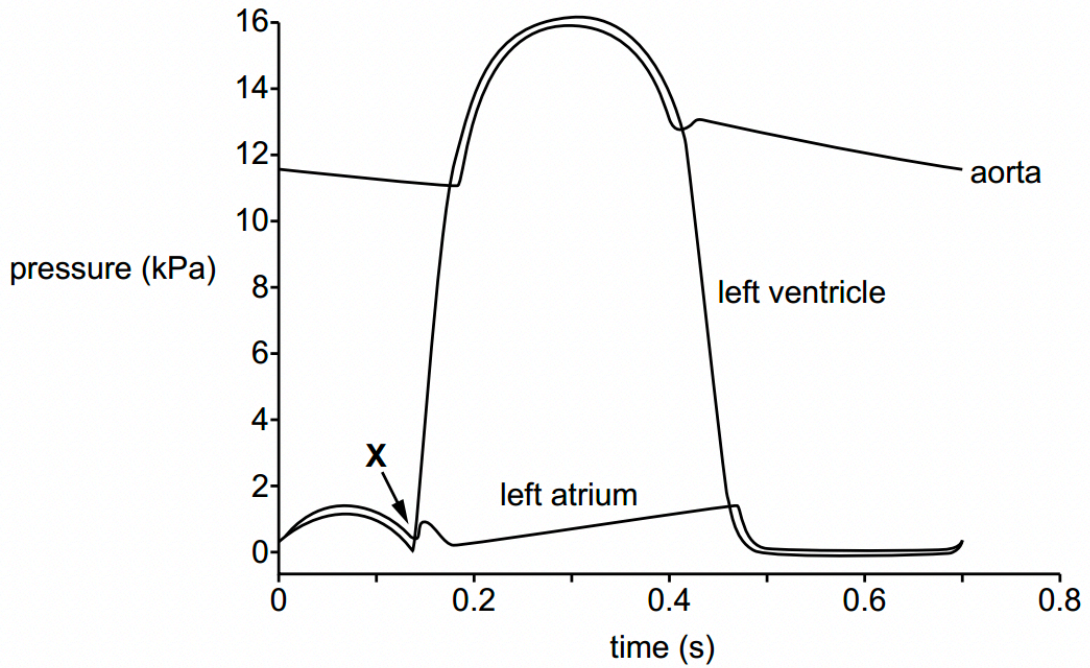


Fig. 16

(ii) Using Fig. 16, calculate the heart rate of this individual.

Give your answer to **2** significant figures.

heart rate = [1]

(iii) Using Fig. 16, calculate the percentage change between minimum and maximum pressure in the aorta.

Give your answer to **2** significant figures.

percentage change = [2]

**0 9**

Table 1 shows the volume of blood in a woman's left ventricle at different times during **one** second.

Table 1

Time / seconds	Volume of blood in left ventricle / cm ³
0.0	112
0.1	120
0.2	95
0.3	65
0.4	50
0.5	55
0.6	82
0.7	90
0.8	100
0.9	112
1.0	120

0 9**. 1**

Use **Table 1** to calculate the heart rate in beats per minute.

Tick (✓) **one** box next to the correct answer.

[1 mark]

60

66.7

75

85.7



- 6 The table shows pressure changes in the left side of the heart during one cardiac cycle.

Time / s	Blood pressure / kPa	
	Left atrium	Left ventricle
0.0	0.7	0.3
0.1	1.0	2.0
0.2	0.1	12.5
0.3	0.2	15.3
0.4	1.0	4.5
0.5	0.5	1.0
0.6	0.6	0.3
0.7	0.7	0.3

- 6 (c) Use the information in the table to calculate the heart rate in beats per minute.

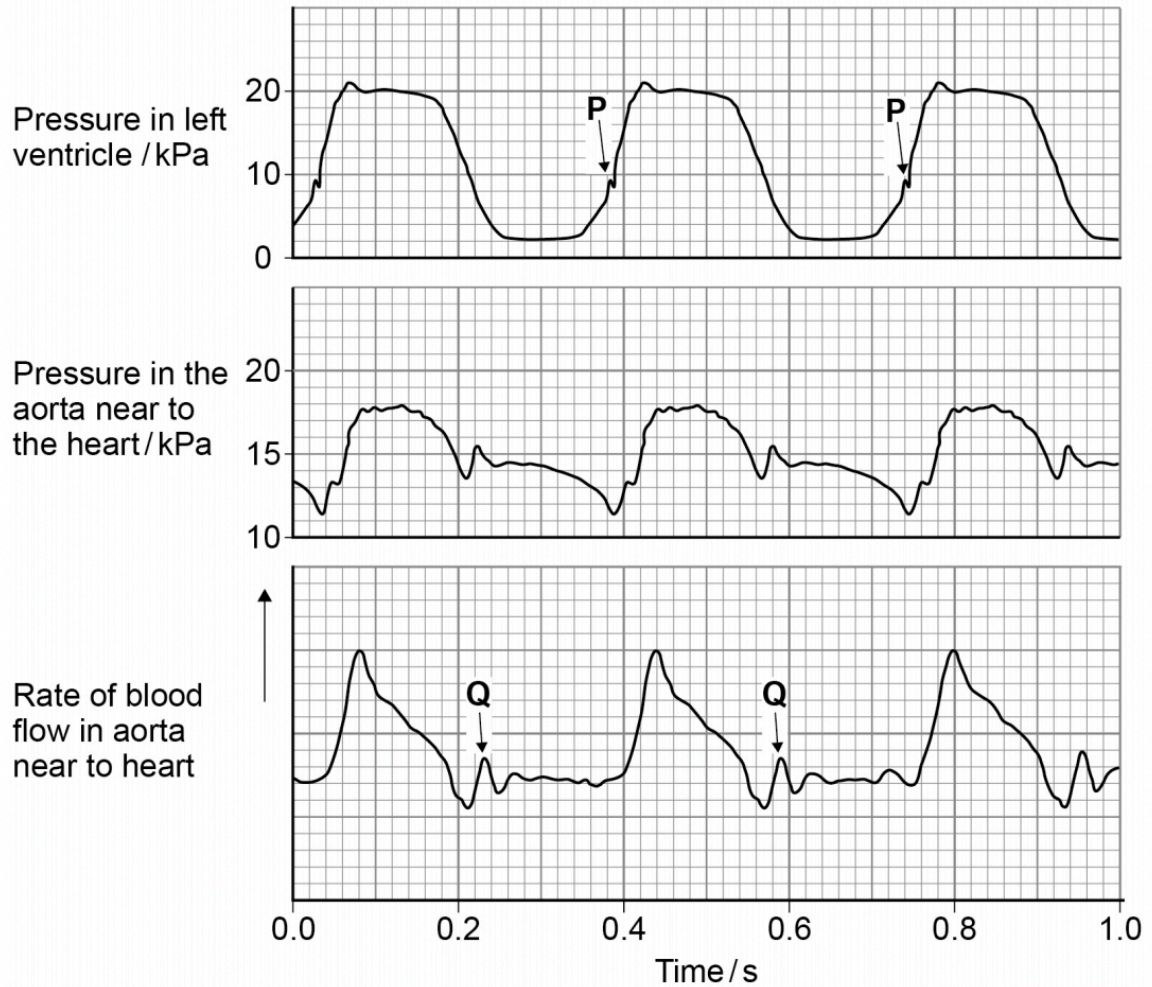
Answer beats per minute
(1 mark)



0 3

Figure 3 shows pressure and blood flow during the cardiac cycle in a dog.

Figure 3



0 3 . 4

Use information from **Figure 3** to calculate the heart rate of this dog.

[1 mark]

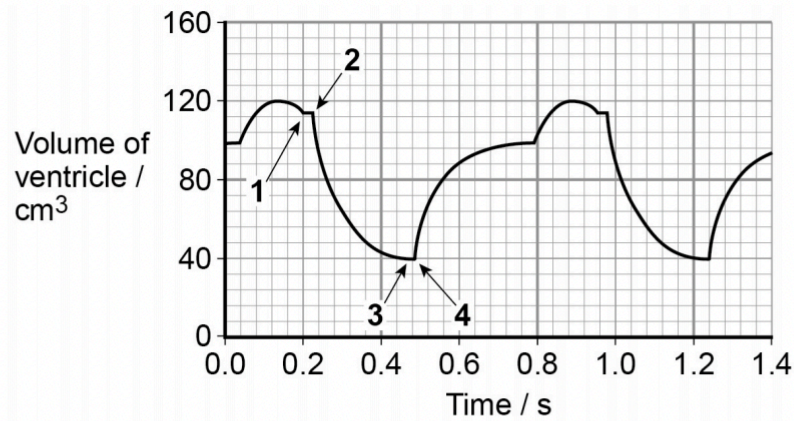
Heart rate _____ beats minute⁻¹



0 4

Figure 3 shows the volume changes in the left ventricle of a human heart during two cardiac cycles. The numbers 1, 2, 3 and 4 represent times when heart valves open or close.

Figure 3



0 4 . 1

Use information from **Figure 3** to complete **Table 2**. Place the number 1, 2, 3 or 4 in the appropriate box.

[2 marks]

Table 2

	Valve opens	Valve closes
Semi-lunar valve		
Atrioventricular valve		

0 4 . 2

Use **Figure 3** to calculate the volume of blood pumped per minute by the left ventricle.

[2 marks]

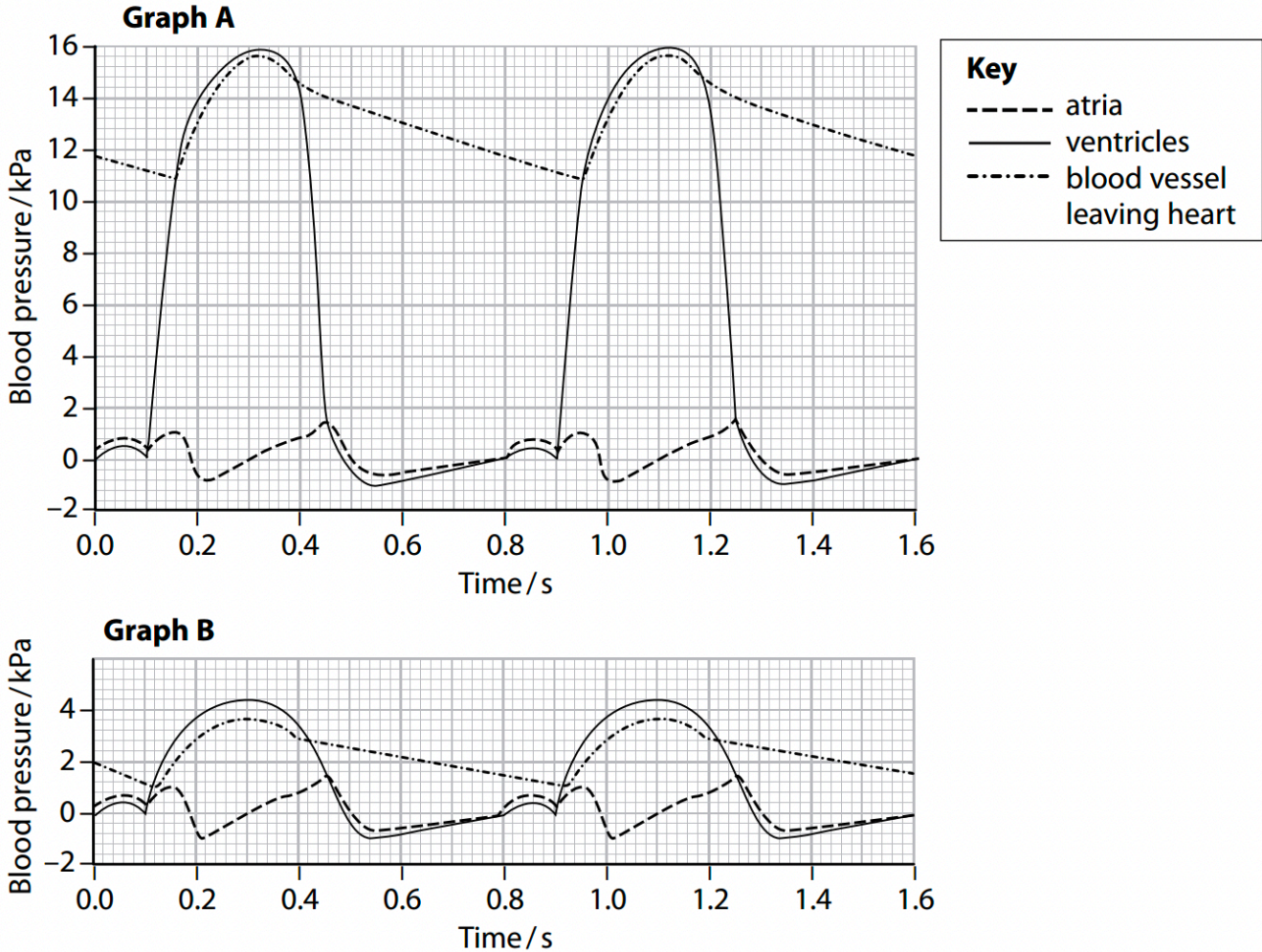
Answer = _____ $\text{cm}^3 \text{min}^{-1}$

CALCULATE HEART RATE



5 The pressure of the blood passing through the heart can vary.

Graph A shows the changes in blood pressure in one side of the heart. Graph B shows the changes in blood pressure in the other side of the heart over the same time period.



(a) (i) Calculate the heart rate.

(2)

- correct figures from graph
- correct answer with unit

Example of calculation
e.g. $120 \div 1.6$ or $60 \div 0.8$
 $120 \div 1.6 / 60 \div 0.8$
75 bpm

Answer

(a)	(ii)	86 bpm ✓	1	AO1.2	Unit must be given ALLOW beats per minute
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(a)	(iii)	45 (%) ✓✓	2	AO1.2	IGNORE + or – ALLOW for 1 max 44 or 46 If answer incorrect or not given to 2 sig.figs: ALLOW for 1 max $5 \div 11 \times 100$ OR 45.45 OR 45.5
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CALCULATE HEART RATE



0 9

Table 1 shows the volume of blood in a woman's left ventricle at different times during **one** second.

Table 1

Time / seconds	Volume of blood in left ventricle / cm ³
0.0	112
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0.2	95
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0.5	55
0.6	82
0.7	90
0.8	100
0.9	112
1.0	120

0 9

. 1

Use **Table 1** to calculate the heart rate in beats per minute.

Tick (✓) **one** box next to the correct answer.

[1 mark]

- 60
- 66.7
- 75
- 85.7

6(c)

85 / 86 / 85.7;

1

Ignore additional decimal places

CALCULATE HEART RATE



03.4 167 (beats minute⁻¹)
OR
164 (beats minute⁻¹)
OR
171 (beats minute⁻¹);

1 Full answers
166.6 recurring,
164.383562,
171.428571

Accept any number of
decimal places as
long as rounding
correct.

04.1		open	closed	2	One mark for each correct column General marker
	Semi-lunar valves	2	3		
	Atrioventricular valves	4	1		
04.2	(Acceptable range is) 6315.79 to 6400;;			2	Allow one mark for (SV = 120 – 40 =) 80 (cm ³) OR (1 cycle = 1.24 – 0.48 =) 0.76 (s) OR 79 / 80 (beats minute ⁻¹)