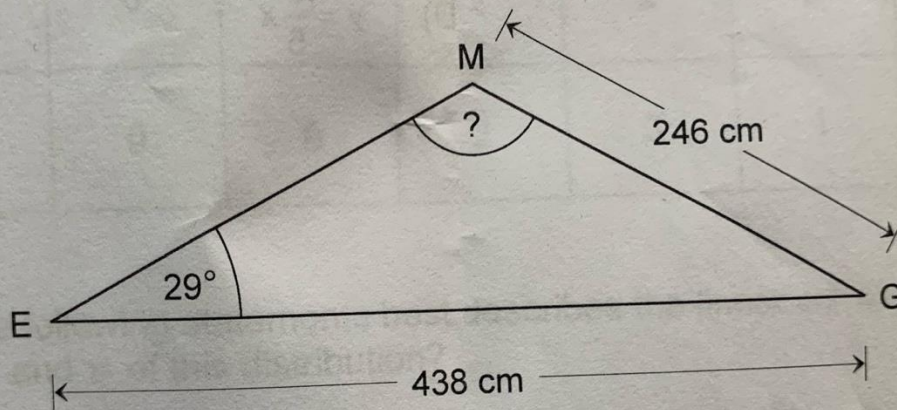


1. Consider obtuse triangle EMG represented below.



To the nearest tenth of a degree, what is the measure of obtuse angle EMG?

- A) 119.3° C) 124.2°
B) 120.3° D) 128.4°

Step 1: Write the Law of Sines

$$\frac{\sin(29^\circ)}{246} = \frac{\sin(M)}{438}.$$

Step 2: Solve for $\sin(M)$

$$\sin(M) = \frac{438 \cdot \sin(29^\circ)}{246}.$$

1. Calculate $\sin(29^\circ)$:

$$\sin(29^\circ) \approx 0.4848.$$

2. Substitute:

$$\sin(M) = \frac{438 \cdot 0.4848}{246}.$$

3. Simplify:

$$\sin(M) = \frac{212.2224}{246} \approx 0.863.$$

$$\angle M = 180^\circ - \sin^{-1}(0.863).$$

From the previous calculation:

$$\sin^{-1}(0.863) \approx 59.55^\circ.$$

Thus:

$$\angle M = 180^\circ - 59.55^\circ = 120.45^\circ.$$

2. Which of the following linear correlation coefficients corresponds to the strongest correlation?

A) -0.92

C) 0.56

B) -0.41

D) 0.73

3. The equation of line l in the Cartesian plane is $y = \frac{5}{8}x - 20$.

Which of the following equations represents a line perpendicular to line l ?

A) $y = -\frac{8}{5}x$

C) $y = \frac{5}{8}x$

B) $y = -\frac{5}{8}x$

D) $y = \frac{8}{5}x$

3. The equation of line l in the Cartesian plane is $y = \frac{5}{8}x - 20$.

Which of the following equations represents a line perpendicular to line l ?

A) $y = -\frac{8}{5}x$

C) $y = \frac{5}{8}x$

B) $y = -\frac{5}{8}x$

D) $y = \frac{8}{5}x$

Consider the linear correlation between variables n and s of a statistical distribution. The table below represents this distribution.

$n \backslash s$	$[0, 8[$	$[8, 16[$	$[16, 24[$	$[24, 32[$	$[32, 40[$	$[40, 48[$
$[5, 10[$	2	1	3	0	0	0
$[10, 15[$	1	1	2	1	1	0
$[15, 20[$	2	2	1	2	2	0
$[20, 25[$	0	2	2	1	1	2
$[25, 30[$	0	1	2	2	2	1
$[30, 35[$	0	0	2	3	1	2

Which of the following statements best describes the linear correlation between variables n and s of this distribution?

A) The linear correlation is negative and weak.

B) The linear correlation is negative and strong.

5. At a soccer game, Yassine sold bottles of water and bottles of juice.

Yassine sold a total of 195 bottles.

The profit made was \$0.75 for each bottle of water sold and \$1.50 for each bottle of juice sold.

The total profit made was \$240.

Let x : number of bottles of water sold

y : number of bottles of juice sold

Which one of the following systems of equations could represent this situation?

A) $x + y = 195$
 $0.75x + 1.50y = 240$

B) $x + y = 195$
 $1.50x + 0.75y = 240$

C) $x + y = 240$
 $0.75x + 1.50y = 195$

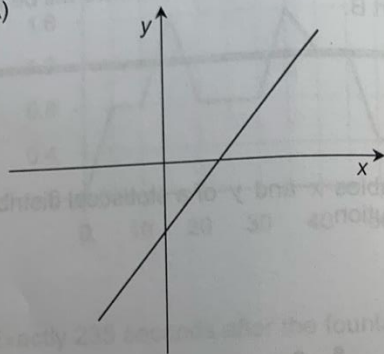
D) $x + y = 240$
 $1.50x + 0.75y = 195$

6. Line l in the Cartesian plane has the following characteristics:

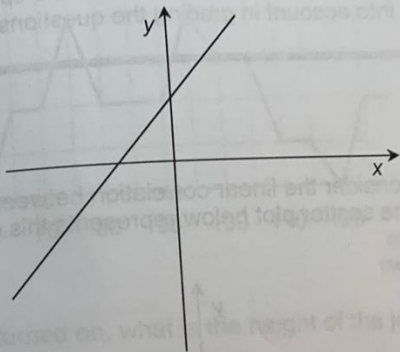
- The slope of line l is less than zero.
- The y -intercept of line l is less than zero.

Which one of the following graphs could represent line l in the Cartesian plane?

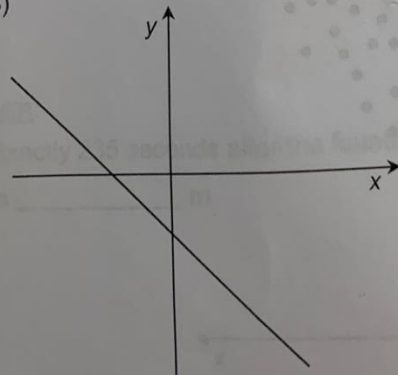
A)



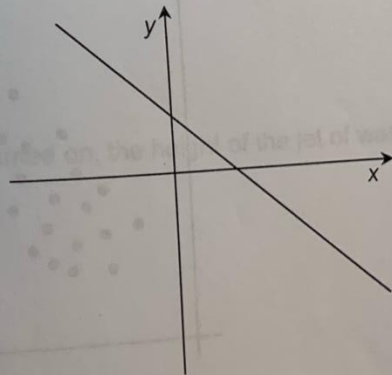
C)



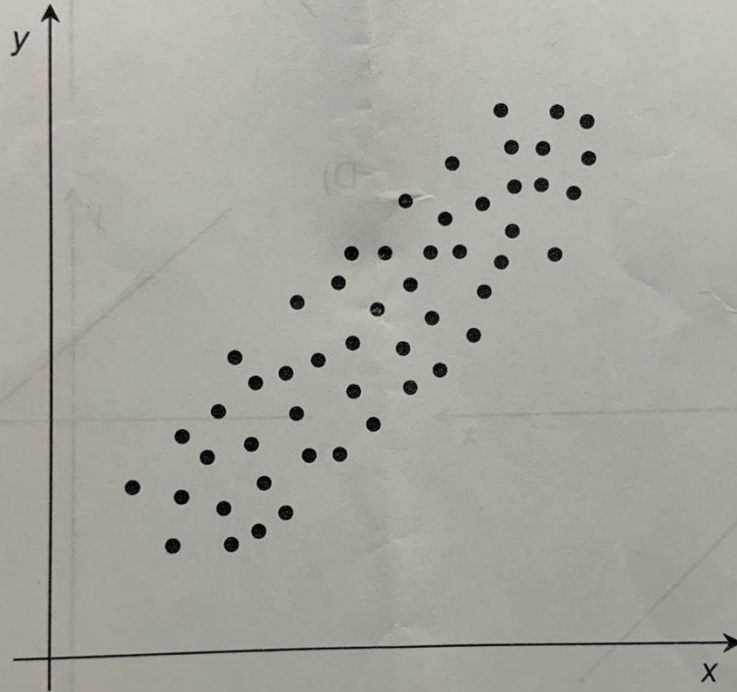
B)



D)



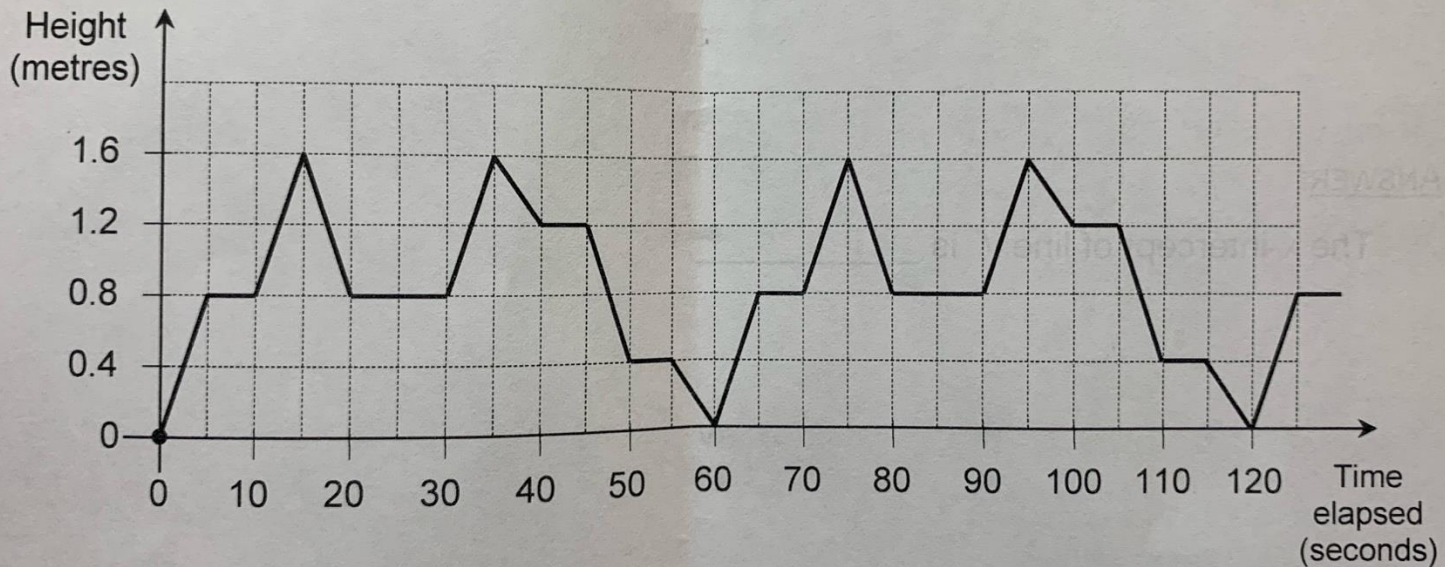
7. Consider the linear correlation between variables x and y of a statistical distribution. The scatter plot below represents this distribution.



What is the approximate value of the linear correlation coefficient between these two variables?

8. A jet of water shoots out of the centre of a fountain.

The periodic function represented below can be used to determine the height of the jet of water in relation to the time elapsed from the moment the fountain is turned on.



Exactly 235 seconds after the fountain is turned on, what is the height of the jet of water?

9. The equation of line l in the Cartesian plane is $y = \frac{5}{4}x - 80$.

What is the x-intercept of line l ?

ANSWER:

The x-intercept of line l is _____.

$$0 = \frac{5}{4}x - 80$$

Rearrange to isolate x :

$$\frac{5}{4}x = 80$$

Multiply through by 4 to eliminate the fraction:

$$5x = 320$$

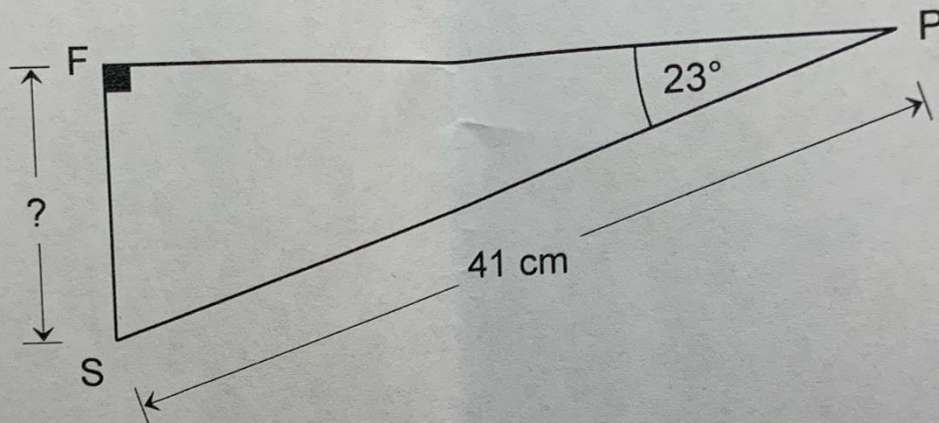
Divide by 5:

$$x = 64$$

So, the **x-intercept** is:

$$(64, 0)$$

10. Consider right triangle SFP represented below.



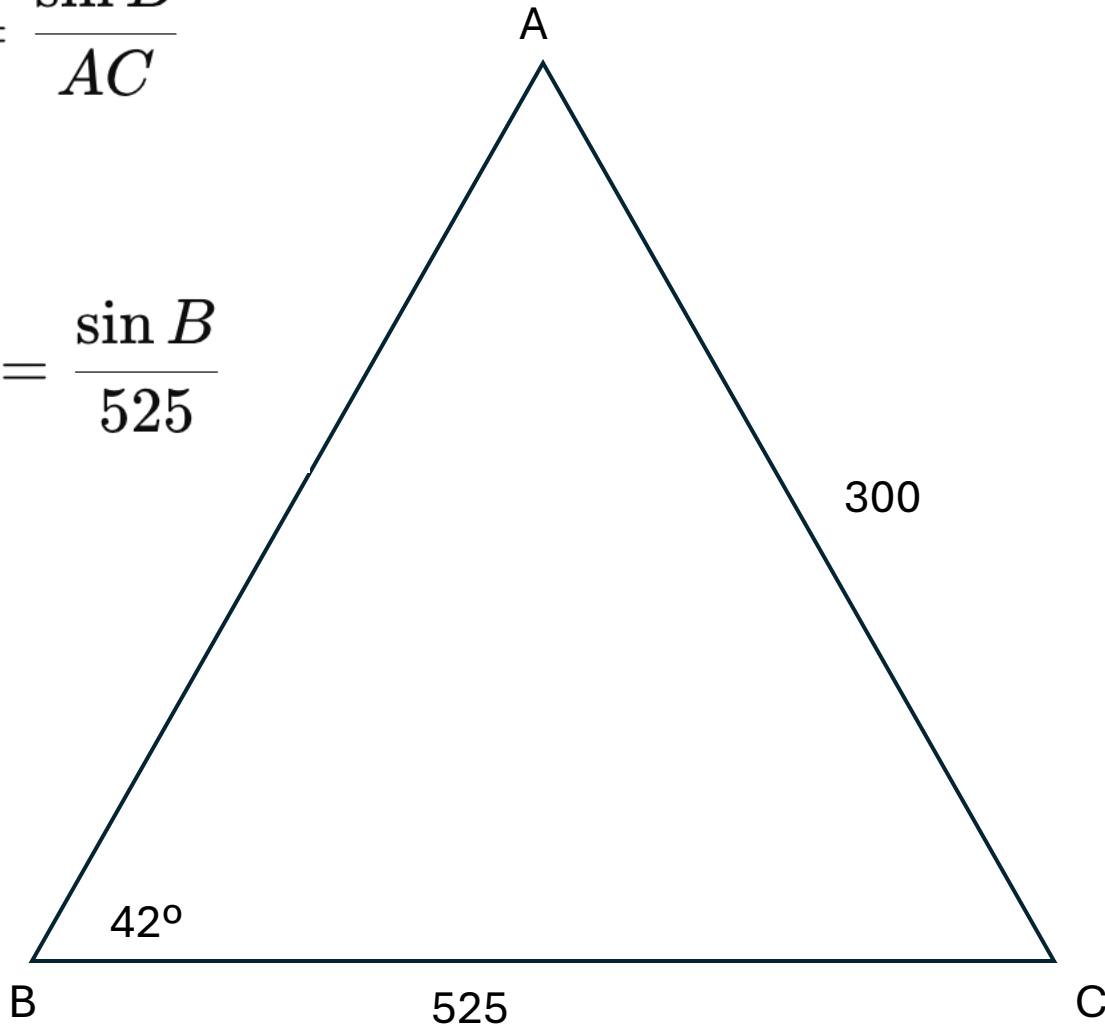
To the nearest centimetre, what is the length of line segment FS?

ANSWER:

To the nearest centimetre, the length of line segment FS is _____ cm.

$$\frac{\sin A}{BC} = \frac{\sin B}{AC}$$

$$\frac{\sin(42^\circ)}{300} = \frac{\sin B}{525}$$



First, calculate $\sin(42^\circ)$ using a calculator:

$$\sin(42^\circ) \approx 0.6691$$

Substitute this value:

$$\frac{0.6691}{300} = \frac{\sin B}{525}$$

Simplify:

$$\sin B = \frac{0.6691 \cdot 525}{300}$$

$$\sin B \approx 1.171$$

The sine of an angle cannot exceed 1. Since $\sin B > 1$, this indicates the triangle with these dimensions does not exist in Euclidean geometry.

If you suspect a calculation or measurement error, double-check the given values for accuracy. Let me know if adjustments are needed!

Step 1: Use the sine function

In a right triangle:

$$\sin(\theta) = \frac{\text{opposite side}}{\text{hypotenuse}}.$$

Here:

$$\sin(P) = \frac{FS}{PS}.$$

Substitute the known values:

$$\sin(23^\circ) = \frac{FS}{41}.$$

Step 2: Solve for FS

Rearrange to isolate FS :

$$FS = 41 \cdot \sin(23^\circ).$$

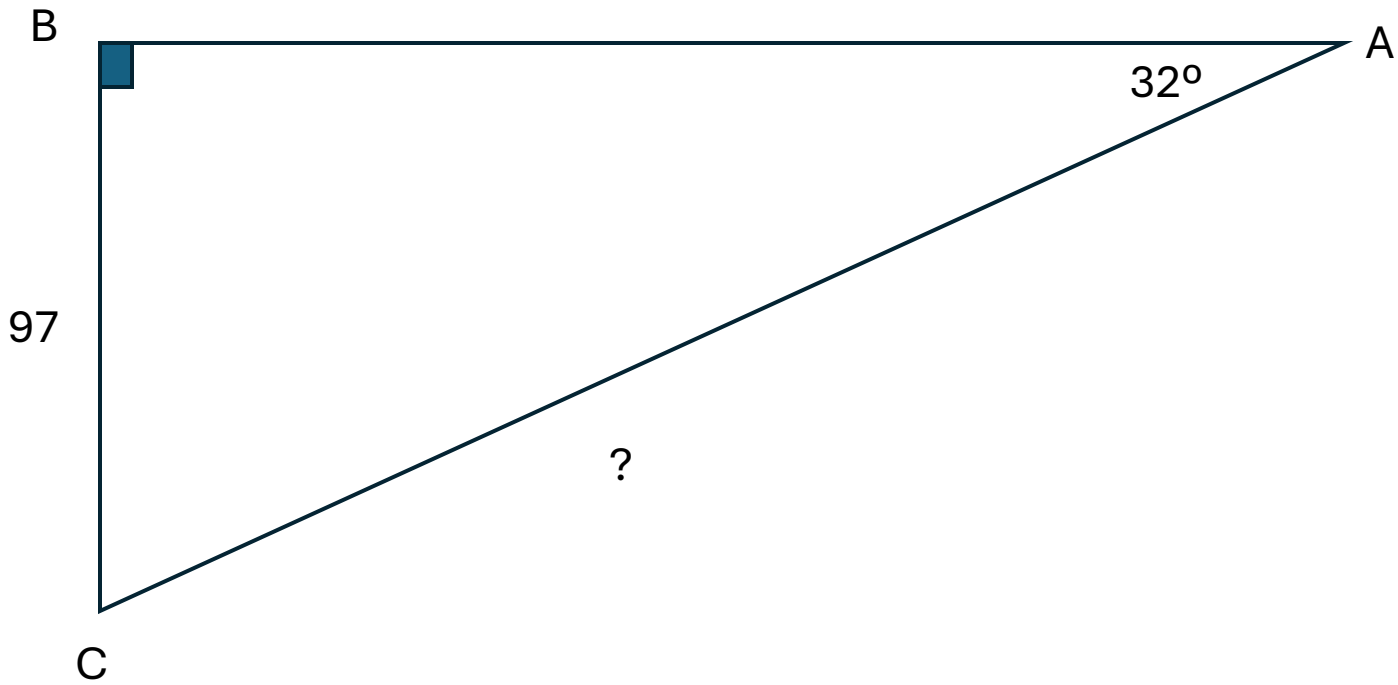
Step 3: Calculate $\sin(23^\circ)$

Using a calculator:

$$\sin(23^\circ) \approx 0.3907.$$

Substitute:

$$FS = 41 \cdot 0.3907 \approx 16.02.$$



$$\sin(A) = \frac{\text{opposite}}{\text{hypotenuse}}$$

Substituting the known values:

$$\sin(32^\circ) = \frac{97}{c}$$

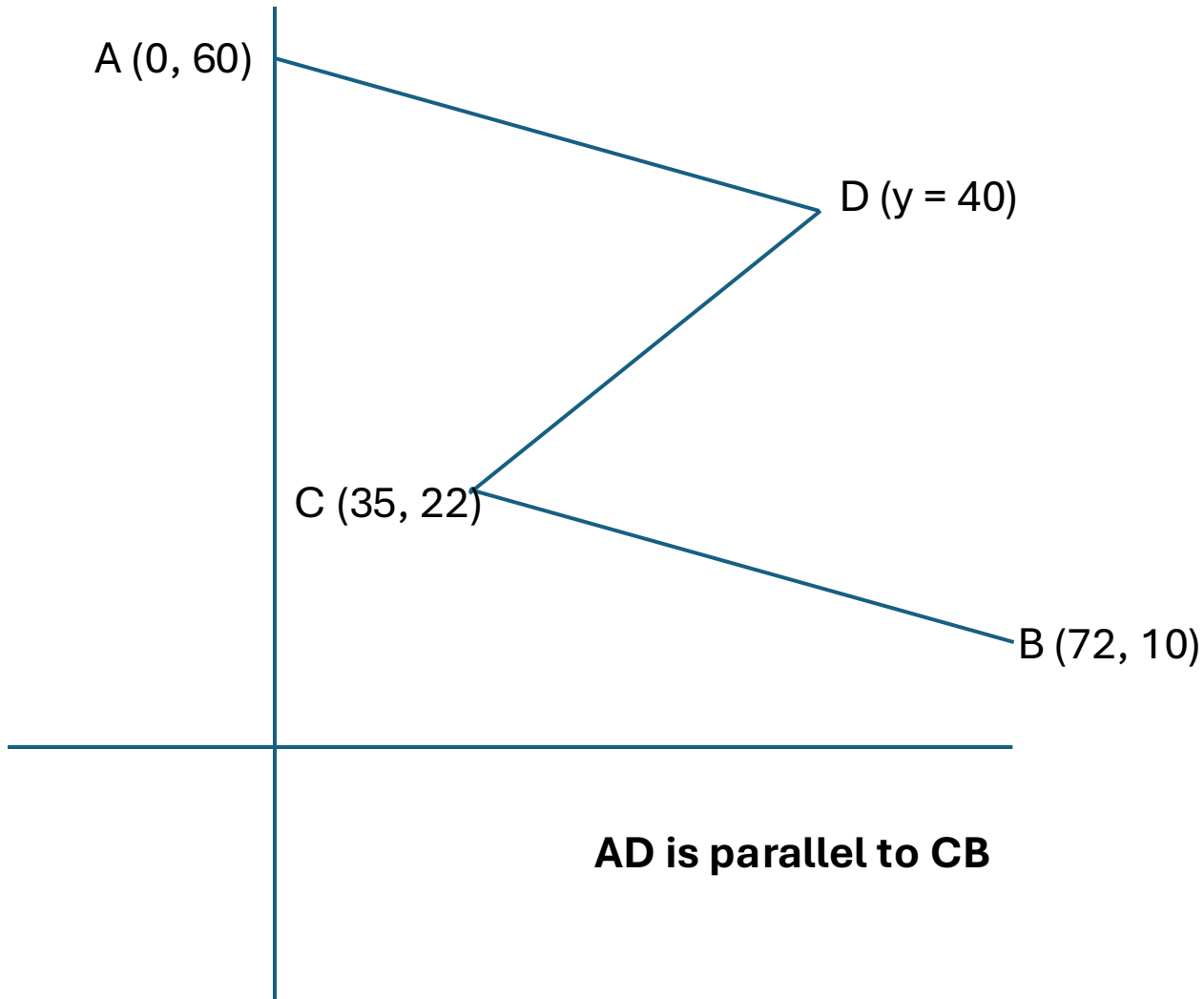
Rearranging for c :

$$c = \frac{97}{\sin(32^\circ)}$$

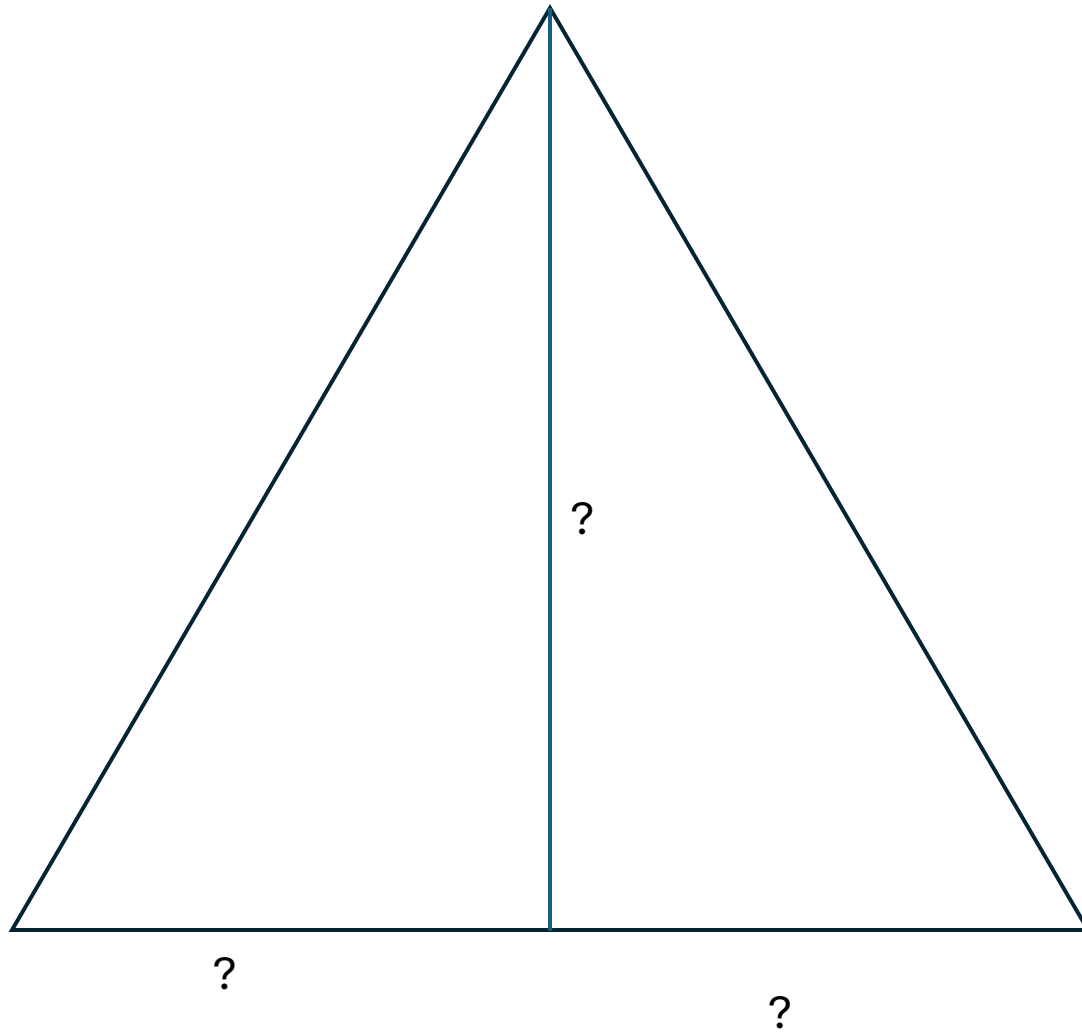
Using a calculator to find $\sin(32^\circ) \approx 0.5299$:

$$c = \frac{97}{0.5299} \approx 183.1 \text{ cm}$$

Find length of CD



	apples	peaches	Total \$
May	50	40	\$75
June	25	20	\$50
July	150	200	?



1

$$\frac{50}{X} = \frac{X}{162}$$

2

$$X^2 = 162 * 50$$

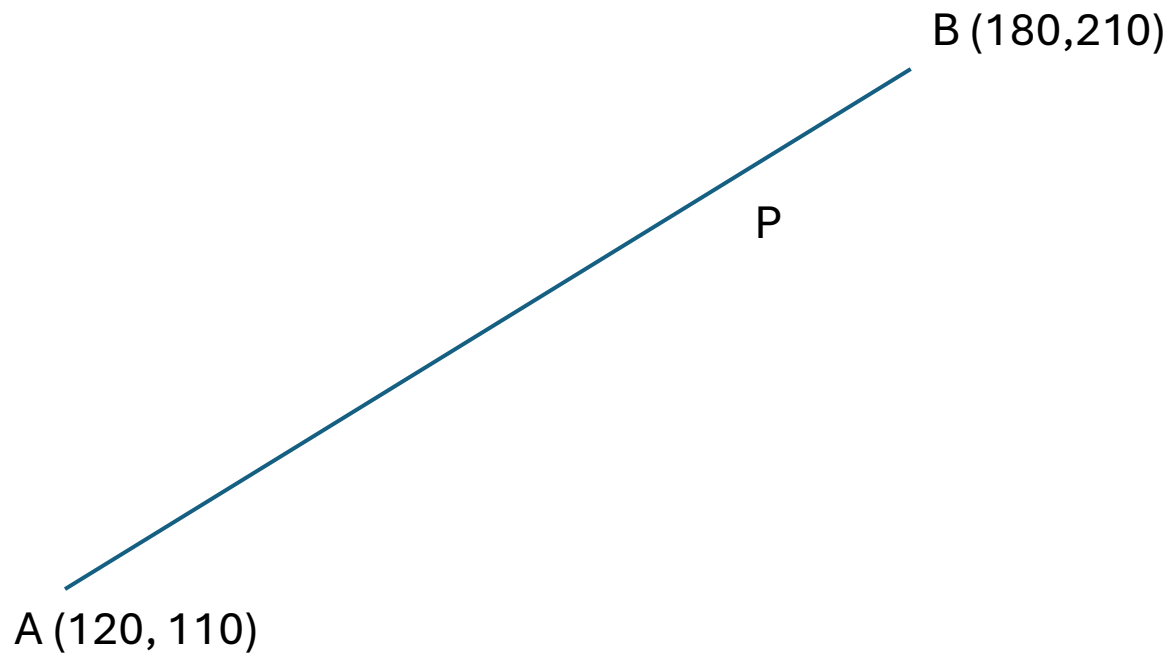
3

$$\sqrt{X^2} = \sqrt{8100}$$

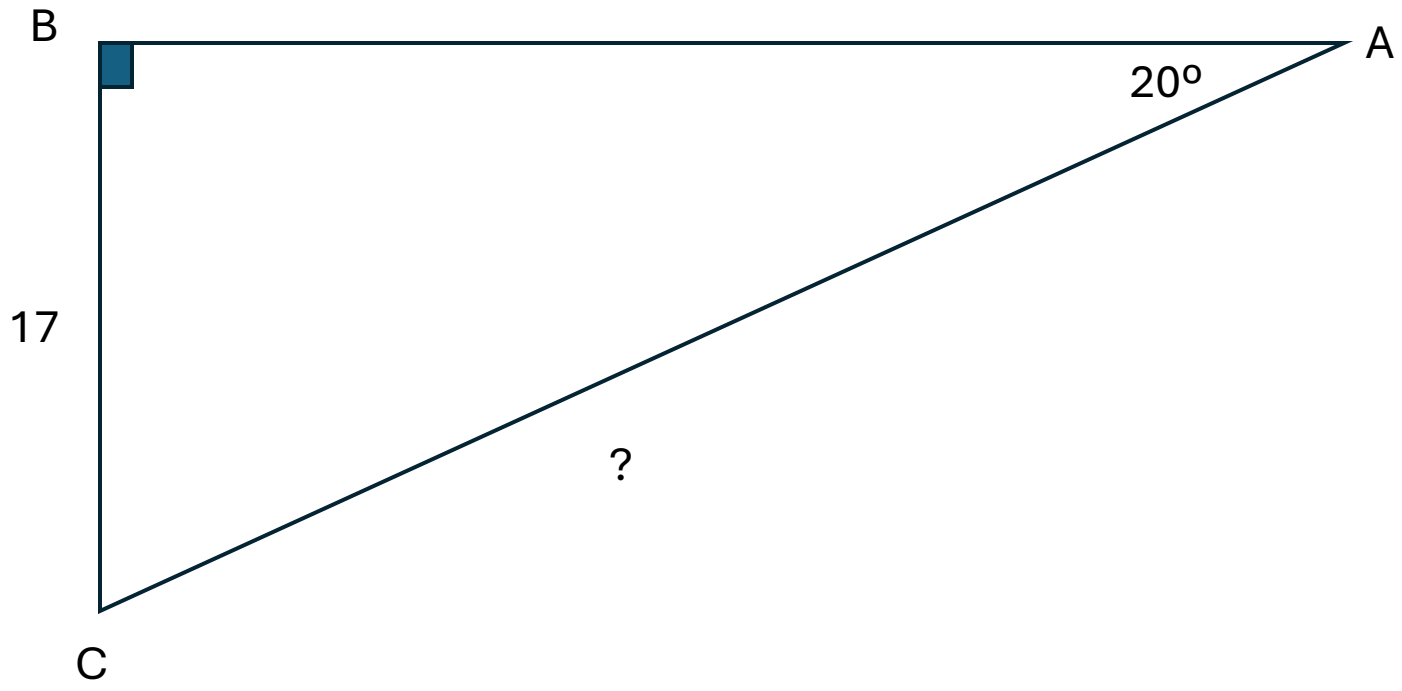
4

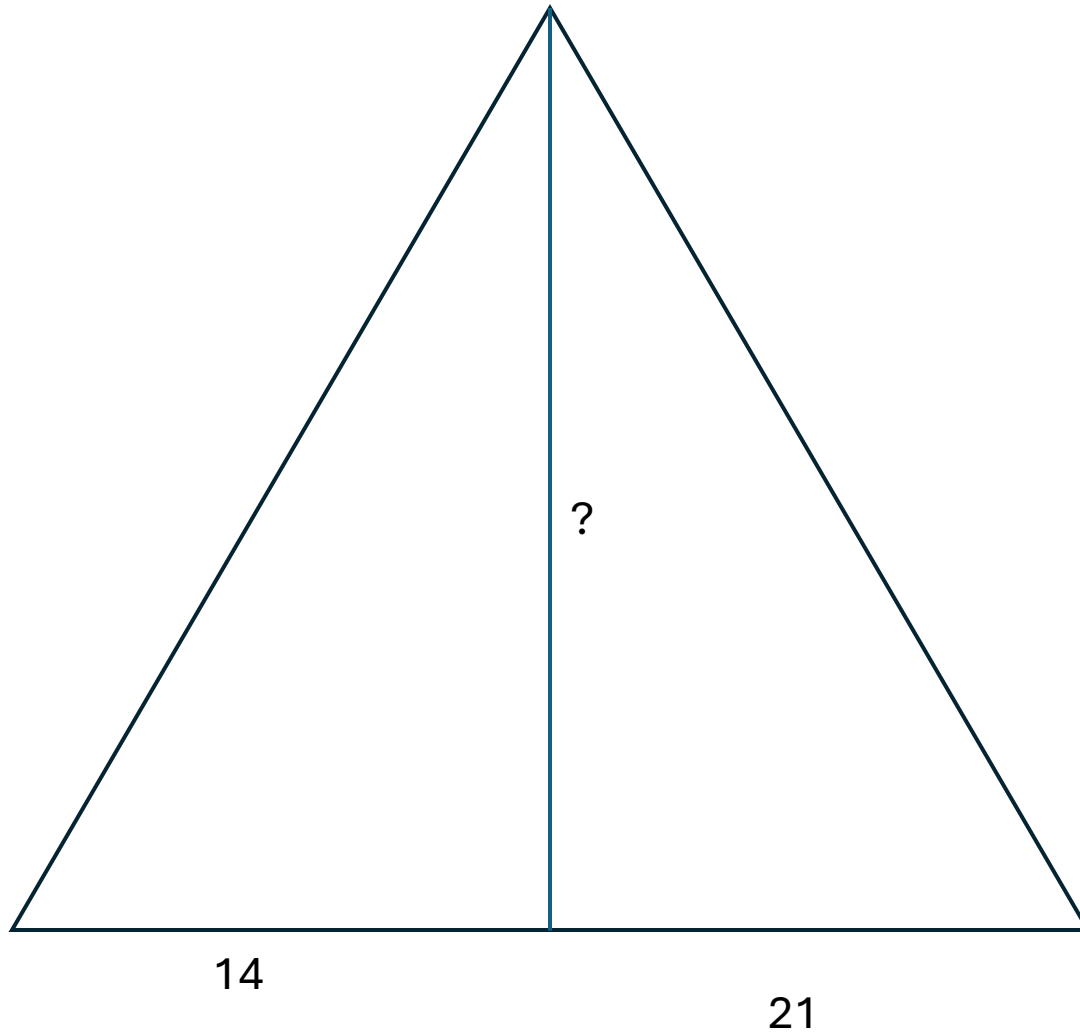
$$X = 90$$

What are the coordinates of point P that is $\frac{4}{7}$ from point A?

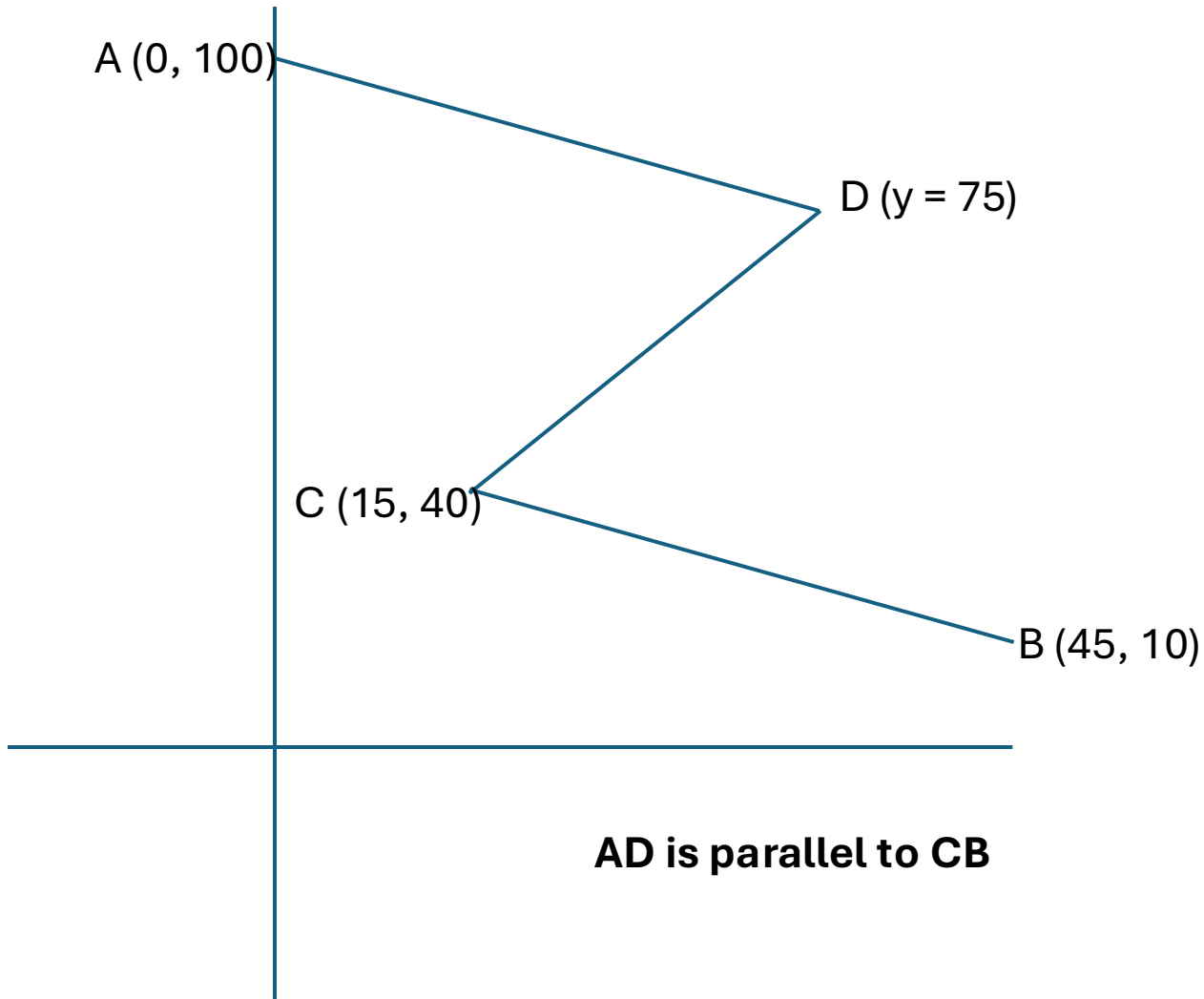


	apples	peaches	Total \$
May	175	80	\$175
June	250	40	\$250
July	150	200	?





Find length of CD

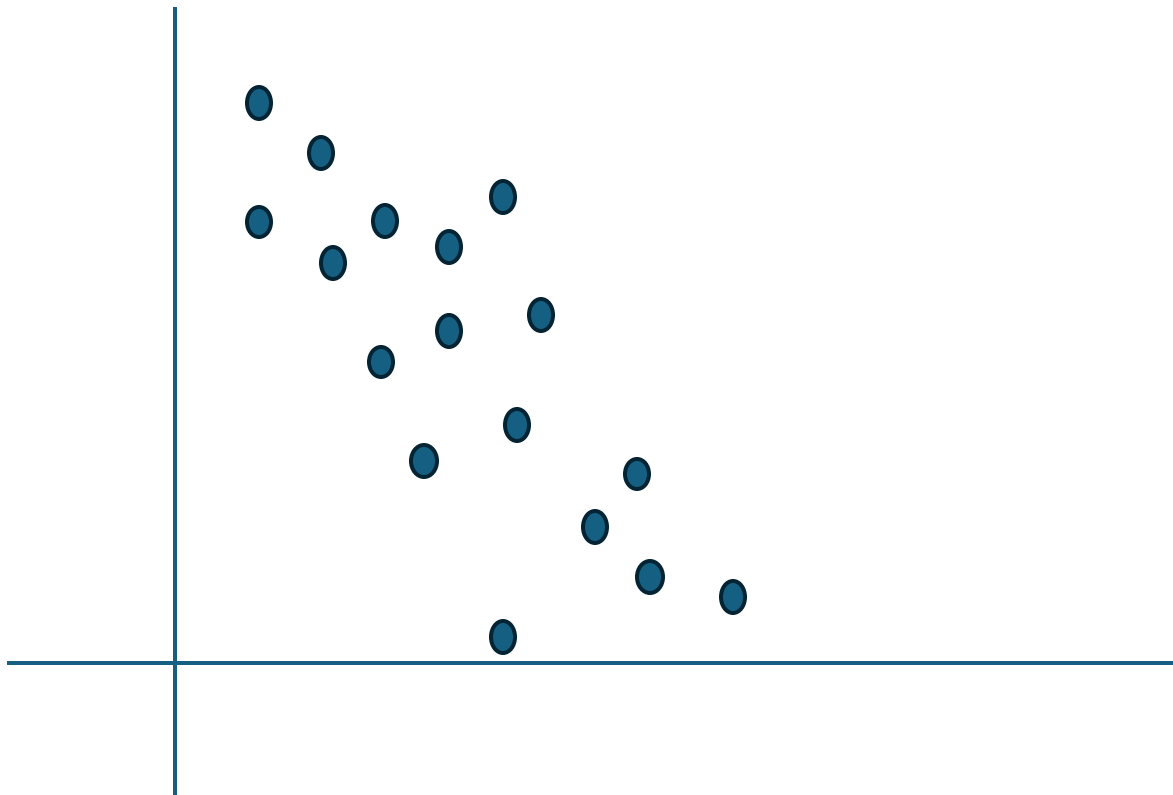


The equation of line AB is $y = -\frac{3}{4}x + 22.5$

The x coordinate of A is 10.

What is the **y coordinate** of A?

What is correlation of the X and Y coordinates of the following distribution?



A data set has 600 values.

Between 107 and 196 → 200 values

4 values are 195

Between 201 and 970 → 475 values

What is the **percentile rank** for 195

To calculate the **percentile rank** of a data value x , you use the formula:

$$\text{Percentile Rank} = \frac{\text{Number of values less than } x + 0.5 \times (\text{Number of values equal to } x)}{\text{Total number of values}} \times 100$$

Substitute values into the formula:

$$\text{Percentile Rank} = \frac{174 + 0.5 \times 4}{650} \times 100$$

Simplify:

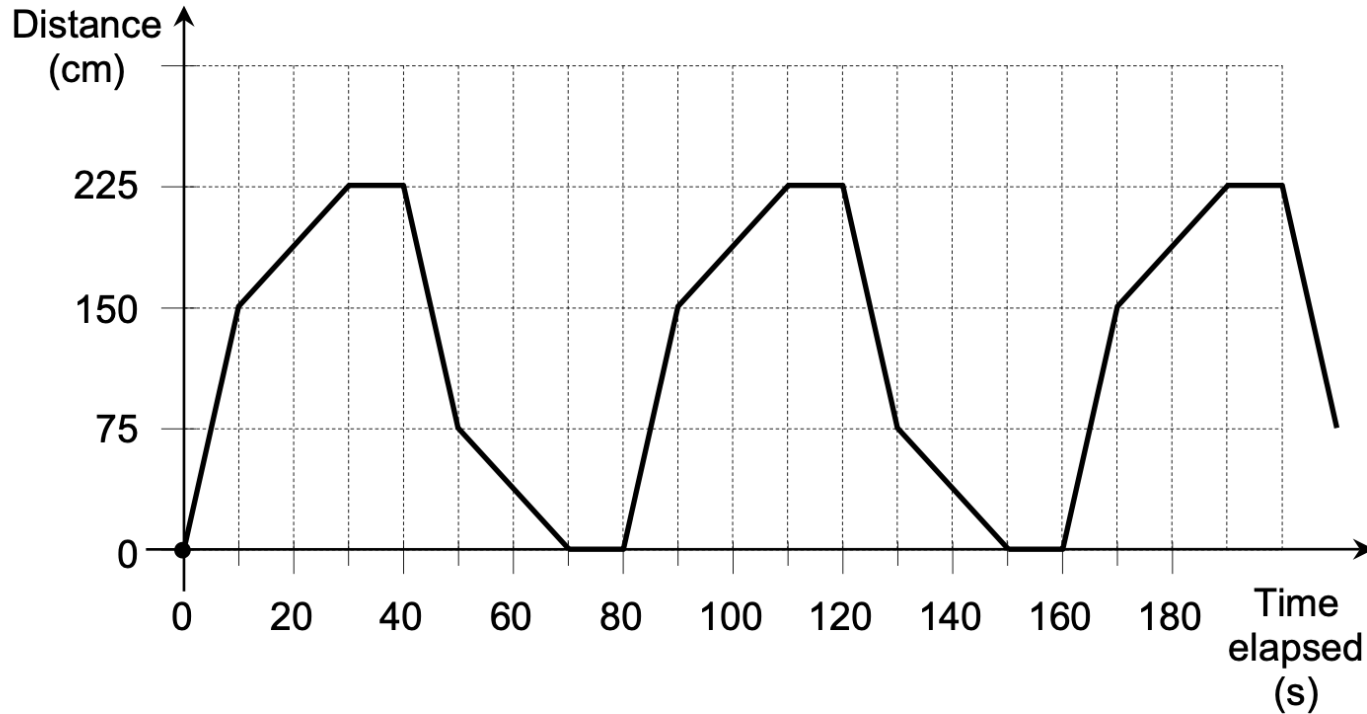
$$\text{Percentile Rank} = \frac{174 + 2}{650} \times 100 = \frac{176}{650} \times 100$$

Final calculation:

$$\text{Percentile Rank} = 27.08$$

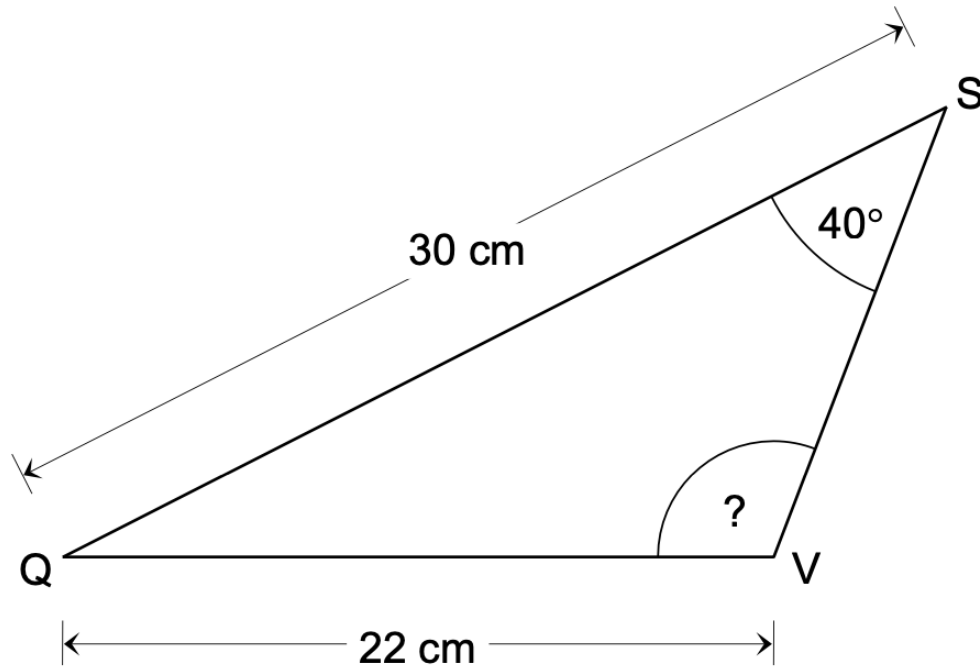
1. A train set is displayed in the window of a toy store. When the train is switched on, it leaves a station and returns to it, going around in a continuous loop.

The periodic function represented below is used to determine the distance between the train and the station in relation to the time elapsed from the moment the train is switched on.



What is the distance between the train and the station exactly 450 seconds after the train is switched on?

2. Consider obtuse triangle QVS represented below.



To the nearest tenth of a degree, what is the measure of obtuse angle QVS?

$$\frac{\sin 40}{22} = \frac{\sin ?}{30}$$

$$\sin ? = \frac{30 * (\sin 40)}{22}$$

$$\sin ? = 180 - \sin^{-1} (.87)$$

$$= 118.77$$

3. An amateur hockey league has 8 teams. The number of points earned last season by each team are:

20 32 32 32 47 49 50 58

The mean number of points earned is 40.

What is the mean deviation of the number of points earned by these teams?

A) 0

C) 9

B) 5

D) 11

$$|20-40|=20$$

$$|32-40|=8$$

$$|32-40|=8$$

$$|32-40|=8$$

$$|47-40|=7$$

$$|49-40|=9$$

$$|50-40|=10$$

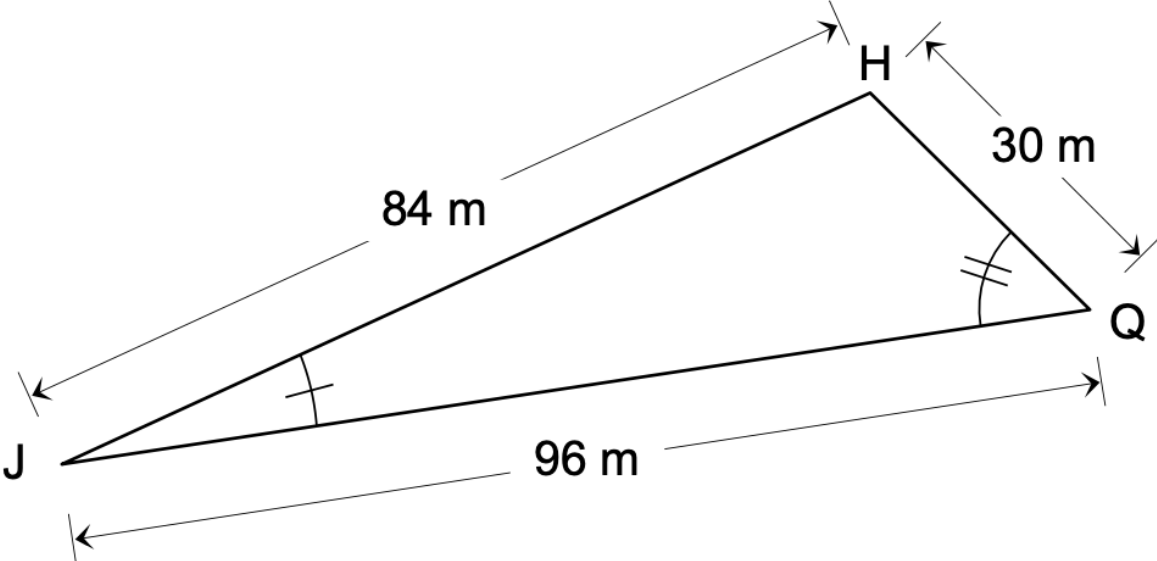
$$|58-40|=18$$

$$20+8+8+8+7+9+10+18=88$$

There are $n = 8$ data points, so:

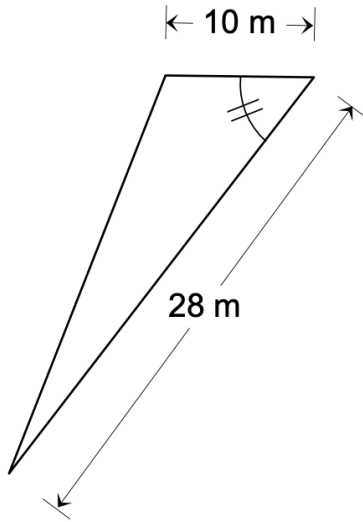
$$\frac{88}{8} = 11$$

4. Consider triangle JHQ represented below.

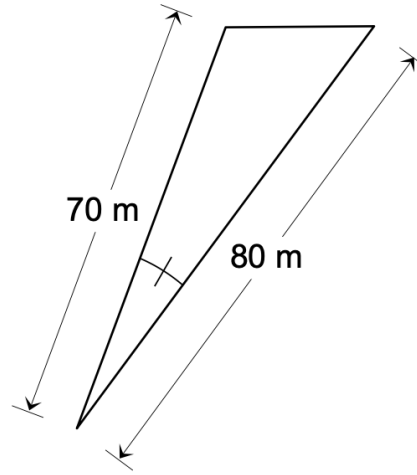


Which of the triangles represented below is necessarily similar to triangle JHQ?

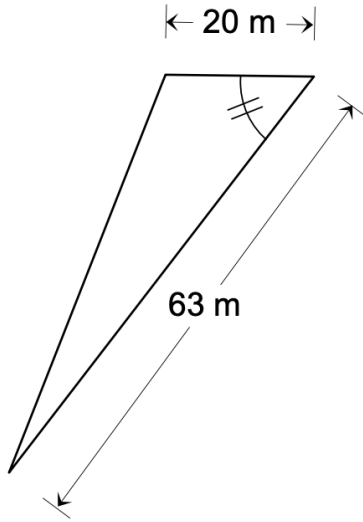
A)



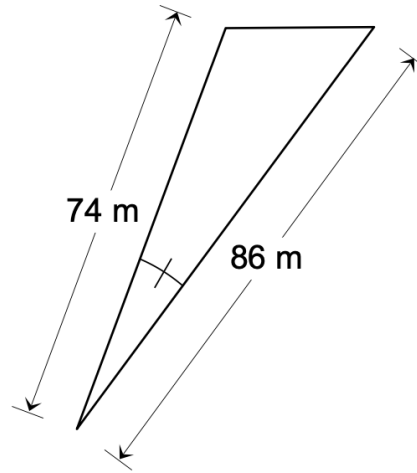
C)



B)



D)



5. Consider the linear correlation between variables j and n of a statistical distributor
The table below represents this distribution.

$j \backslash n$	$[0, 3[$	$[3, 6[$	$[6, 9[$	$[9, 12[$	$[12, 15[$	$[15, 18[$
$[10, 12[$	14	1	0	0	0	0
$[12, 14[$	1	16	1	0	0	0
$[14, 16[$	0	2	14	2	0	0
$[16, 18[$	0	0	1	18	1	0
$[18, 20[$	0	0	0	0	14	0
$[20, 22[$	0	0	0	0	1	13

6. Points P(0, 74) and S(30, 24) are on line PS in the Cartesian plane.

Which of the following equations represents a line parallel to line PS?

A) $y = -\frac{5}{3}x + 18$

C) $y = \frac{3}{5}x + 18$

B) $y = -\frac{3}{5}x + 18$

D) $y = \frac{5}{3}x + 18$

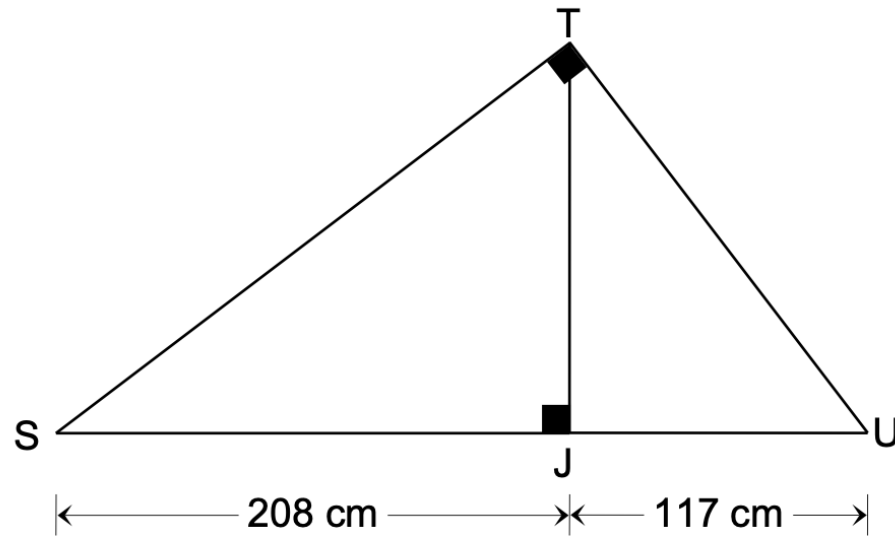
$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{24 - 74}{30 - 0}$$

$$m = \frac{-50}{30}$$

$$m = -\frac{5}{3}$$

7. Altitude TJ was drawn in right triangle STU represented below.



What is the length of altitude TJ?

$$\frac{208}{X} = \frac{X}{117}$$

$$X^2 = 24,336$$

$$X = 156$$

8. The 475 data values in a statistical distribution are given in increasing order.

150, 153, ..., 289, 290, 290, 291, ..., 800
47 data values 426 data values

What percentile rank is associated with 290?

ANSWER:

The _____ percentile rank is associated with 290.

To calculate the **percentile rank** of a data value x , you use the formula:

$$\text{Percentile Rank} = \frac{\text{Number of values less than } x + 0.5 \times (\text{Number of values equal to } x)}{\text{Total number of values}} \times 100$$

$$\frac{47 + \frac{1}{2}(2)}{475} * 100$$

$$= 10.10$$

10. In a laboratory, a biologist observes a biological sample over a period of time.

The number of bacteria in the sample in relation to the time elapsed since the beginning of the observation period is represented by function f described below.

$$f(x) = 5(2)^x$$

where x : time elapsed, in hours, since the beginning of the observation period

$f(x)$: number of bacteria in the sample

There are currently 320 bacteria in the sample.

How much time, in hours, has elapsed since the beginning of the observation period?

ANSWER:

_____ hours have elapsed since the beginning of the observation period.

11. BASKETS

A merchant sells baskets of peppers and baskets of zucchini.

The cost of each basket of peppers is the same. The cost of each basket of zucchini is the same.

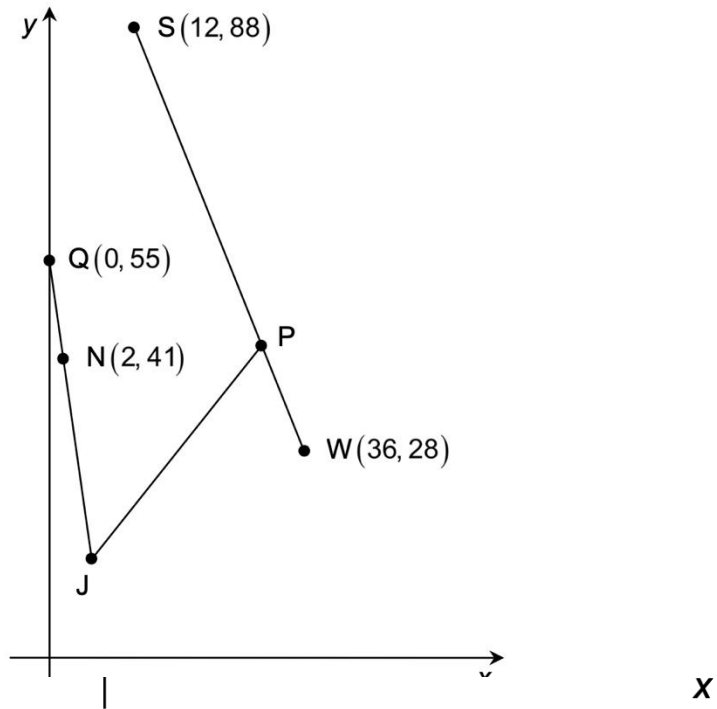
The table below provides information on the purchases made by three customers.

Customer	Number of baskets of peppers	Number of baskets of zucchini	Total cost
Leah	5	4	\$35.25
Mario	8	5	\$49.75
Pascal	9	6	?

What is the total cost of the baskets that Pascal bought?

12. LINE SEGMENT JP

Line segments QJ, SW and JP are represented below in the Cartesian plane.



- ◆ From point S, point P is located $\frac{3}{4}$ of the way along line segment SW.
- ◆ The x-coordinate of point J is 6.

What is the slope of line segment JP?

15. WOODEN DECKS

Clara, Jacob and Victor each have a wooden deck in their backyard. They hire the same contractor to either varnish or paint their decks.

The three decks are square, but of different sizes.

VARNISHING

Function f described below can be used to determine the cost of varnishing a square deck.

$$f(x) = 8.8x^2$$

where x : length of one of the sides of the deck, in metres

$f(x)$: cost of varnishing the deck, in dollars

PAINTING

Function g described below can be used to determine the cost of painting a square deck.

$$g(x) = ax^2$$

where x : length of one of the sides of the deck, in metres

$g(x)$: cost of painting the deck, in dollars

- ◆ The cost of varnishing Clara's deck is \$178.20.
- ◆ The cost of painting Clara's deck is \$283.50.
- ◆ The cost of painting Jacob's deck is \$143.36.
- ◆ Each side of Victor's deck measures 1.8 m more than each side of Jacob's deck.

What is the cost of varnishing Victor's deck?