

TB(2B) Ch. 9 Pyth. Thm & Irrational Numbers
Pythagoras' Theorem
Conventional Questions

1. [16-17 St. Test #2]

Figure 1 shows $\triangle ABC$. Prove that $\triangle ABC$ is a right-angled triangle.

(2 marks)

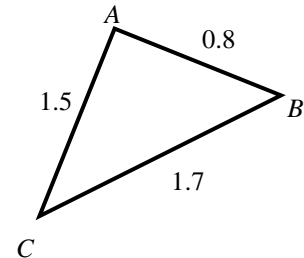


Figure 1

2. [16-17 St. Test #9]

In Figure 4, BDC is a straight line. $AC = 26$ cm, $AB = 4\sqrt{37}$ cm, $CD : BD = 5 : 2$ and $AD \perp BC$. Find the length of AD .

(3 marks)

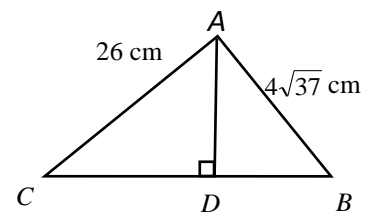


Figure 4

3. [16-17 Final #11]

In Figure 3, D is a point lying on AC such that BD is perpendicular to AC . It is given that $AC = 39$ cm, $BD = 24$ cm and the area of $\triangle ABD$ is less than the area of $\triangle BCD$ by 300 cm².

(a) Find AD and CD .

(2 marks)

(b) Find the perimeter of $\triangle ABC$.

(2 marks)

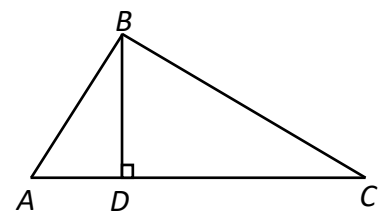
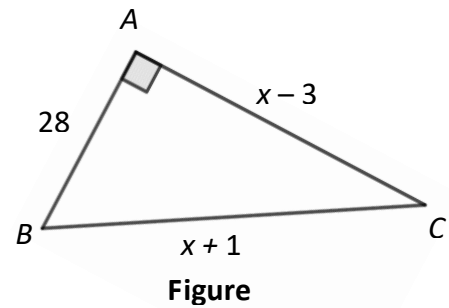


Figure 3

4. [17-18 St. Test 2 #3]

In **Figure 1**, it is given that $AB = 28$, $AC = x - 3$ and $BC = x + 1$. Find the value of x . (3 marks)



5. [17-18 St. Test 2 #5]

In **Figure 3**, $ABCD$ and $EFGH$ are two vertical buildings on the same horizontal level. It is given the area of $CDEF$ is 9300 m^2 , the height of the two buildings are 70 m and 85 m respectively.

(a) Find DE . (2 marks)

(b) Emma claims that $\triangle CEF$ is a right-angled triangle. Do you agree? Explain your answer.

(3 marks)

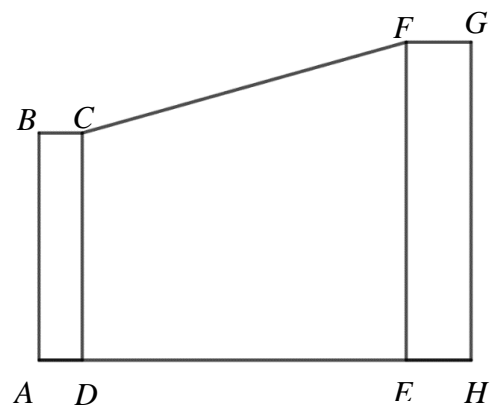


Figure 3

6. [17-18 Final Exam #13]

Figure 5a shows a logo $ABCDEF$ for the Walkathon designed by Mary. The frame of her logo consists of two identical semi-circles ABC and CDE and an isosceles triangle $\triangle AEF$ with $AF = EF$. It is given that ACE is a straight line, and the areas of each semi-circle and the triangle are 12.5π sq. units and 100 sq. units respectively.

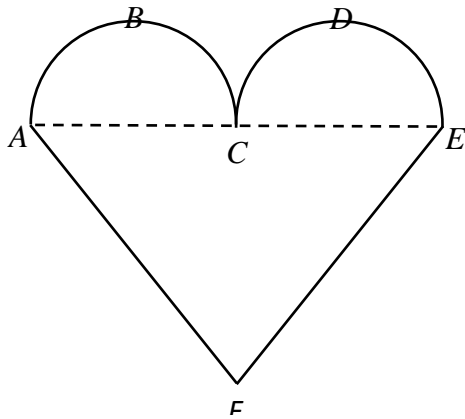


Figure 5a

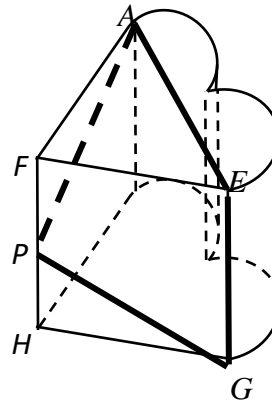


Figure 5b

- (a) Find the radius of a semi-circle. (2 marks)
- (b) (i) Find CF .
 (ii) Rose claims that $\triangle AEF$ is a right-angled triangle. Do you agree? Explain your answer. (4 marks)
- (c) Mary's logo is being selected to make a souvenir for promoting the walkathon as shown in Figure 5b. Her logo is printed on a wooden prism with the base same as her logo frame. Let G and H be the points on the bottom base vertically below E and F respectively. Two identical thin ribbons are used to decorate the souvenir by connecting G and A . One ribbon passes through the vertex E , while the other ribbon passes through a point P on FH making GPA the shortest. Find the height of the souvenir. (2 marks)

7. [18-19 Mid-year Exam #11]

Figure 1 shows a triangle ABC . D is point on BC such that $AD \perp BC$. $AD = 4$ cm, $BD = 2$ cm and $AC = \sqrt{80}$ cm.

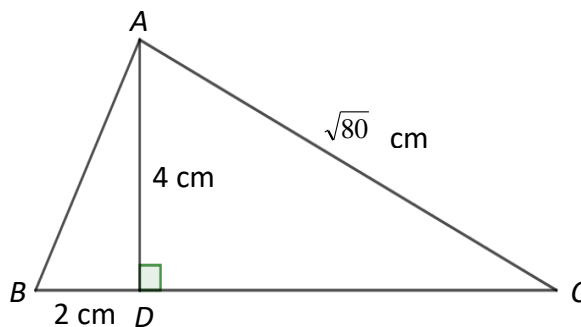


Figure 1

- (a) Find AB and CD . Give your answers correct to 3 significant figures if necessary. (3 marks)
- (b) Prove that $\triangle ABC$ is a right-angled triangle. (2 marks)

8.[18-19 Mid-year Exam #12]

Figure 2 shows a trapezium $ABCD$. $AD \parallel BC$ and AC is perpendicular to the two parallel sides. It is given that $AD = 5$ cm, $AB = 15$ cm and $CD = 13$ cm.

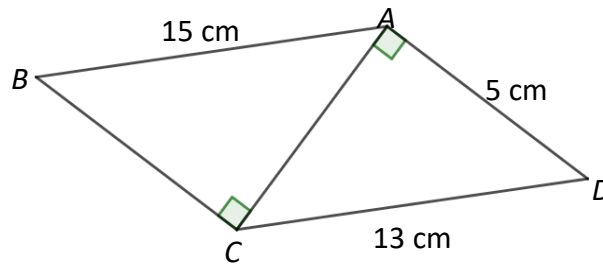


Figure 2

- (a) Find the area of trapezium $ABCD$. (3 marks)
- (b) Amy claims that the diagonal BD is longer than 18.5 cm. Do you agree? Explain your answer. (2 marks)

9. [18-19 Final Exam #4]

In Figure 1, $AB = 20$ cm, $BD = 16$ cm and $AD = 12$ cm. C is a point on BD .

- (a) Show that $\triangle ABD$ is a right-angled triangle where $\angle D = 90^\circ$. (2 marks)
- (b) If $BC = 7$ cm, find AC . (2 marks)

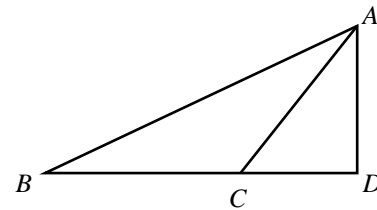


Figure 1

10. [19-20 Mid-year Exam #9]

Figure 2 shows a triangle ABC . D is a point on AB such that $AB \perp CD$. If $AD = 3.6$, $BC = 8$ and $AC = 6$, find the length of BD . (3 marks)

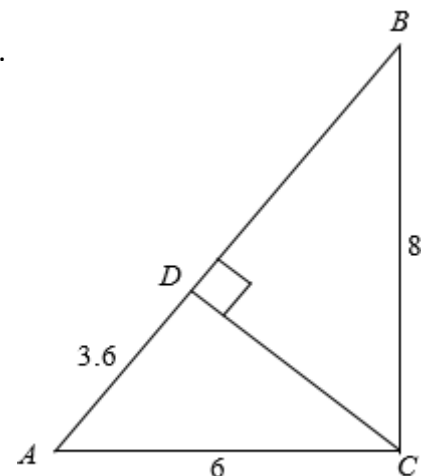
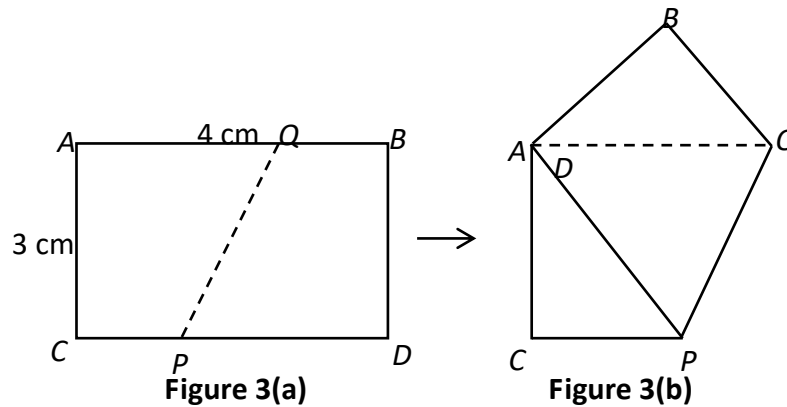


Figure 2

11. [19-20 Mid-year Exam #13]

In **Figure 3(a)**, $ABDC$ is a piece of rectangular paper. $AB = 4$ cm and $AC = 3$ cm. The paper is folded along PQ so that A and D coincide as shown in **Figure 3(b)**. Let $CP = x$ cm.



- (a) Express the length of DP in terms of x . (1 mark)
- (b) Find the length of CP . (2 marks)
- (c) Find the length of PQ . Lv 3 (2 marks)

12. [20-21 Mid-year Exam #5]

Simplify the following expressions and rationalize the denominator of the result if necessary. Leave your answers in surd form.

- (a) $\sqrt{98} - \sqrt{50}$ (2 marks)
- (b) $\sqrt{\frac{108}{5}}$ (2 marks)

13. [20-21 Mid-year Exam #6]

Figure 1 shows a triangle XYZ . Prove that $\triangle XYZ$ is a right-angled triangle. (2 marks)

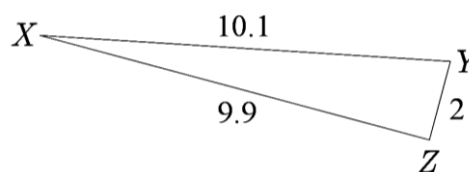


Figure 1

14. [20-21 Final Exam #1]

Refer to **Figure 1**, write down the length of AB on the given blank.



Figure 1

$AB =$ _____

(1 mark)

15. [20-21 Final Exam #9]

Rationalize the denominator of $\frac{21}{\sqrt{14}}$.

(2 marks)

16. [20-21 Final Exam #18]

In **Figure 7a**, a ladder 195 cm long is placed against a vertical wall AB . The foot and tip of the ladder touch the horizontal ground and the wall at P and Q respectively. It is known that Q is 189 cm above the ground.

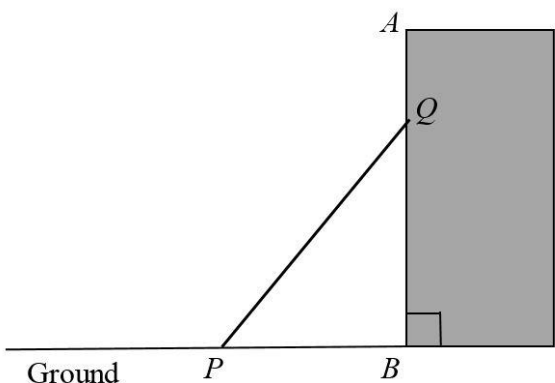


Figure 7a

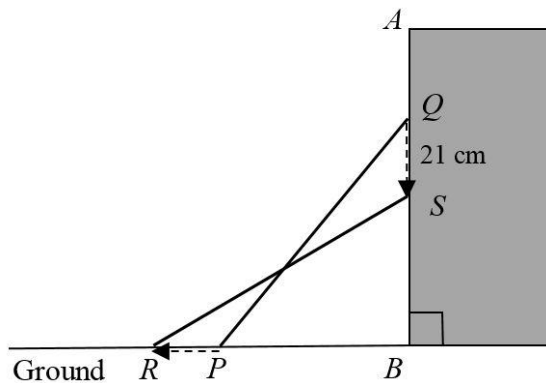


Figure 7b

- (a) Find PB . (2 marks)
- (b) If the tip of the ladder slides 21 cm vertically down the wall as shown in **Figure 7b**, then the foot and tip of the ladder will touch the horizontal ground and the wall at R and S respectively. How far will the foot of the ladder slide? (2 marks)

~ End ~