

# MATHLETICS

## Trigonometry and the Right-angled Triangle

Teacher Book - Series J-2

$\sin \theta$   $\cos \theta$   
 $\tan \theta$



Mathletics  
Instant  
Workbooks



# Trigonometry and the right-angled triangle

## Topic Test

## PART A

- Instructions** This part consists of 10 multiple-choice questions  
Each question is worth 1 mark  
Attempt ALL questions  
Calculators are NOT to be used  
Fill in only ONE CIRCLE for each question

**Time allowed: 15 minutes**

**Total marks = 10**

	Marks
<b>1</b> Use your calculator to find $\sin 36^\circ$ correct to two decimal places. (A) 0.58      (B) 0.57      (C) 0.59      (D) 0.81	1
<b>2</b> Evaluate $12 \sin 85^\circ$ correct to two decimal places. (A) 12.05      (B) 11.95      (C) 1.05      (D) 137.16	1
<b>3</b> Find the value of $\frac{\sin 38^\circ - \cos 55^\circ}{\tan 36^\circ}$ correct to one decimal place. (A) 0.2      (B) 0.5      (C) 0.05      (D) 0.1	1
<b>4</b> If $\sin \theta = \frac{4}{7}$ , calculate the size of the angle $\theta$ to the nearest degree. (A) 55      (B) 30      (C) 35      (D) 45	1
<b>5</b> A 3 metre ladder leans against a building with its top reaching a height of 2.6 metres. What angle, to the nearest degree, does the ladder make with the wall? (A) 35      (B) 40      (C) 30      (D) None of these	1
<b>6</b> In the triangle ABC, the angle B is $90^\circ$ , AB is 4 m and AC is 5 m. Find the size of angle A correct to the nearest degree. (A) 37      (B) 53      (C) 39      (D) 27	1
<b>7</b> Jane is flying a kite on a 100 m string that makes an angle of $48^\circ$ with the horizontal. How high is the kite above Jane's hand? Give your answer correct to the nearest metre. (A) 65 m      (B) 82 m      (C) 78 m      (D) 74 m	1
<b>8</b> The diagonal of a rectangle makes an angle of $42^\circ$ with one of the longer sides. If the length of the rectangle is 12 cm, find the length of the diagonal correct to one decimal place. (A) 15.8 m      (B) 22.5 m      (C) 16.1 m      (D) 17.9 m	1
<b>9</b> From the top of a tower the angle of depression of a boat is $30^\circ$ . If the tower is 20 m high, how far is the boat from the foot of the tower? (A) 40 m      (B) $10\sqrt{3}$ m      (C) $20\sqrt{2}$ m      (D) $20\sqrt{3}$ m	1
<b>10</b> If $\cos \theta = \frac{1}{2}$ , find the size of angle $\theta$ . (A) 30      (B) 60      (C) 45      (D) 55	1

**Total marks achieved for PART A**

10

# Trigonometry and the right-angled triangle

## Topic Test

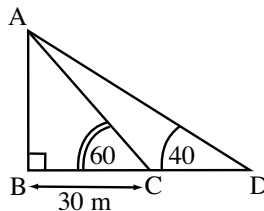
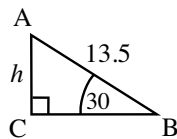
## PART B

**Instructions** This part consists of 15 questions  
 Each question is worth 1 mark  
 Attempt ALL questions  
 Calculators may be used

**Time allowed: 20 minutes**

**Total marks = 15**

Questions	Answers only	Marks
Use your calculator to find correct to two decimal places:		
<b>1</b> $\tan 58$ .	_____	1
<b>2</b> $\sin 63$ .	_____	1
<b>3</b> $19.7 \cos 78$ .	_____	1
<b>4</b> $\frac{28.67}{\sin 46}$ .	_____	1
<b>5</b> $\frac{\sin 35 + \cos 35}{\tan 34}$ .	_____	1
<b>6</b> $\tan 48 - \sin 30 + \cos 73$	_____	1
Calculate the size of each angle to the nearest degree if:		
<b>7</b> $\cos \theta = \frac{4}{5}$ .	_____	1
<b>8</b> $\sin \theta = \frac{12}{13}$ .	_____	1
<b>9</b> $\tan \theta = 0.6781$ .	_____	1
For the triangle ABC given opposite, calculate:		
<b>10</b> the value of $h$ .	_____	1
<b>11</b> the size of $\angle A$ .	_____	1
<b>12</b> the length of BC.	_____	1
From the diagram given opposite find:		
<b>13</b> the length of the side AB.	_____	1
<b>14</b> the length of the side CD.	_____	1
<b>15</b> the angle DAC.	_____	1



**Total marks achieved for PART B**

15
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# Answers – Trigonometry and the right-angled triangle

**PAGE 1** 1 a  $x = \text{opp.}, y = \text{adj.}, z = \text{hyp.}$  b  $x = \text{hyp.}, y = \text{adj.}, z = \text{opp.}$  c  $x = \text{opp.}, y = \text{adj.}, z = \text{hyp.}$  d  $x = \text{opp.}, y = \text{adj.}, z = \text{hyp.}$  e  $x = \text{adj.}, y = \text{hyp.}, z = \text{opp.}$  f  $x = \text{hyp.}, y = \text{opp.}, z = \text{adj.}$  2 a  $p = \text{opp.}, q = \text{adj.}, r = \text{hyp.}$  b  $a = \text{adj.}, b = \text{opp.}, c = \text{hyp.}$  c  $d = \text{opp.}, e = \text{adj.}, f = \text{hyp.}$  d  $a = \text{opp.}, b = \text{adj.}, c = \text{hyp.}$  e  $p = \text{opp.}, q = \text{hyp.}, r = \text{adj.}$  f  $l = \text{adj.}, m = \text{opp.}, n = \text{hyp.}$  3 a BC b EF c PQ

**PAGE 2** 1 a  $\sin X = \frac{x}{17}, \cos X = \frac{y}{17}, \tan X = \frac{x}{y}$  b  $\sin \theta = \frac{a}{c}, \cos \theta = \frac{10}{c}, \tan \theta = \frac{a}{10}$  c  $\sin 30 = \frac{8}{m}, \cos 30 = \frac{p}{m}, \tan 30 = \frac{8}{p}$

d  $\sin \theta = \frac{a}{c}, \cos \theta = \frac{b}{c}, \tan \theta = \frac{a}{b}$  e  $\sin \theta = \frac{q}{r}, \cos \theta = \frac{p}{r}, \tan \theta = \frac{q}{p}$  f  $\sin \theta = \frac{l}{n}, \cos \theta = \frac{m}{n}, \tan \theta = \frac{l}{m}$  2 a  $\sin \theta = \frac{6}{10}, \cos \theta = \frac{8}{10}, \tan \theta = \frac{6}{8}$

b  $\sin \theta = \frac{3}{5}, \cos \theta = \frac{4}{5}, \tan \theta = \frac{3}{4}$  c  $\sin \theta = \frac{12}{13}, \cos \theta = \frac{5}{13}, \tan \theta = \frac{12}{5}$  d  $\sin \theta = \frac{12}{15}, \cos \theta = \frac{9}{15}, \tan \theta = \frac{12}{9}$  e  $\sin \theta = \frac{7}{25}, \cos \theta = \frac{24}{25}, \tan \theta = \frac{7}{24}$

f  $\sin \theta = \frac{15}{17}, \cos \theta = \frac{8}{17}, \tan \theta = \frac{15}{8}$  3 a  $AB = 37, \sin \theta = \frac{12}{37}, \cos \theta = \frac{35}{37}, \tan \theta = \frac{12}{35}$  b  $PQ = \sqrt{29}, \sin \theta = \frac{5}{\sqrt{29}}, \cos \theta = \frac{2}{\sqrt{29}}, \tan \theta = \frac{5}{2}$

c  $XY = \sqrt{34}, \sin \theta = \frac{3}{\sqrt{34}}, \cos \theta = \frac{5}{\sqrt{34}}, \tan \theta = \frac{3}{5}$

**PAGE 3** 1 a 0.934 b 0.500 c 0.384 d 0.139 e 0.532 f 0.848 g 0.601 h 0.574 i 0.731 2 a 1.87 b 1.60 c 0.458 d 7.56 e 0.803 f 0.878 g 0.861 h 12.8 i 0.620 3 a 0.27 b 0.09 c 17.68 d 0.14 e 0.33 f 23.37 g 0.06 h 0.09 i 92.18 4 a 35 b 38 c 36 d 53 e 49 f 56 g 69 h 73 i 84 5 a 30 b 69 06' c 52 59' d 61 05' e 38 36' f 28 56' 6 a 60 b 46 14' c 50 42' d 34 17' e 44 25' f 60

**PAGE 4** 1 a 6.9 cm b 4.5 cm c 13.8 cm 2 a 3.381 cm b 10.113 cm c 12.400 cm 3 a 3.04 cm b  $y = 12.64$  cm c  $m = 6.45$  cm d 7.97 cm e 22.17 cm f 17.10 cm 4 a 46 m 5 4.37 cm

**PAGE 5** 1 a 11.8 cm b 9.2 cm c 15.2 cm 2 a 4.7 cm b 20.5 cm c 11.4 cm 3 a 31.3 cm b 35.0 cm c 15.7 cm d 18.2 cm e 21.9 cm f 50.8 cm 4  $BD = 11.5$  cm,  $AB = 13.3$  cm 5 12.36 cm

**PAGE 6** 1 a 23 06' b 53 08' c 23 47' 2 a 26 17' b 17 43' c 64 17' 3 a 72 29' b 26 42' c 48 54' d 13 41' e 51 45' f 63 49' 4 51 5 34

**PAGE 7** 1 a  $\frac{1}{2}$  b  $\frac{\sqrt{3}}{2}$  c  $\frac{1}{2\sqrt{2}}$  d  $\frac{1}{2}$  e  $\frac{1}{\sqrt{2}}$  f  $\frac{1}{2}$  g  $\frac{1}{\sqrt{2}}$  h  $\sqrt{3}$  i  $\frac{\sqrt{3}}{2}$  j  $\frac{1}{\sqrt{3}}$  k  $\frac{1}{4}$  l 1 m 1 n  $\frac{1}{\sqrt{3}}$  o  $\frac{1}{2}$

p  $\sqrt{3}$  q  $\frac{\sqrt{2}}{2}$  r  $\frac{1}{\sqrt{3}}$  2 Answers will vary 3 Answers will vary 4 10.39 m

**PAGE 8** 1 a 320 m b 52 22' c 62.50 m 2 a i  $BC = 170.24$  km ii  $AC = 226.90$  km b N48 49'E c i 83.36 km ii 86.32 km

**PAGE 9** 1 a 164.85 m b 78.32 m c 20 2 a 9.5 cm b 36 52' c 15 cm 3  $p = 7.5$  cm,  $q = 8.7$  cm 4 a 452 m b 370 m

**PAGE 10** 1 C 2 B 3 D 4 C 5 C 6 A 7 D 8 C 9 D 10 B

**PAGE 11** 1 1.60 2 0.89 3 4.10 4 39.86 5 2.06 6 0.90 7 37 8 67 9 34 10 6.75 11 60 12 11.69 13 51.96 m 14 31.93 m 15 20