4.14 Pythagoras' Theorem: Test Pack

Calculators not allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A ramp rises 1.2 m over a horizontal distance of 3.5 m. Calculate the length of the ramp to the nearest centimetre.

(3)

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2 A square picture has diagonal 14 cm. Find the length of each side of the square, giving your answer in cm to 2 decimal places.

(2)

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3 A triangular sail is right-angled with equal short sides of length x. The hypotenuse measures 10 m. Find x.

(3)

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4 A TV screen has width 48 cm and diagonal 55 cm. Calculate the height of the screen to the nearest millimetre.

(3)

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5 A rectangle is 7 cm long and 3 cm wide. Work out the length of a diagonal. Give your answer correct to 1 decimal place.

(3)

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6 Jack walks 12 km east and then 16 km north. How far is Jack from the starting point in a straight line?

(3)

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7 A rectangular field is 8 m long and its diagonal is 10 m. Work out the width of the field.

(3)

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8 A TV screen is 24 cm wide and 10 cm high. Calculate the length of its diagonal.

(3)

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9 Work out the distance between (1, 1) and (2, 7). Give your answer correct to 1 decimal place.

(3)

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10 A rectangular field is 12 m long and its diagonal is 15 m. Work out the width of the field.

(3)

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11 Elena walks 9 km east and then 40 km north. How far is Elena from the starting point in a straight line?

(3)

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12 A rectangle is 12 cm wide. Its diagonal is 20 cm. Work out its perimeter.

(4)

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13 Work out the distance between (3, 3) and (5, 9). Give your answer correct to 1 decimal place.

(3)

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14 A ramp rises 2.4 m over a horizontal distance of 7 m. Calculate the length of the ramp.

(2)

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15 A ship sails 45 km due east from port P to point Q, then sails 28 km due north from Q to point R.

(a) Calculate the direct distance from P to R. **(2)**

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(b) The ship then sails directly back from R to P at a speed of 13 km/h. **(2)**
Calculate how long the return journey takes, giving your answer in hours to 1 decimal place.

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Mark scheme · 4.14 Pythagoras' Theorem: Test Pack

Question 1

method: length^2 = 1.2^2 + 3.5^2 = 1.44 + 12.25 = 13.69	M1
length = $\sqrt{13.69}$ = 3.7 m (to 2 s.f.)	A1
length given to nearest cm as 370 cm cao	B1

Answer: **370 cm**

Question 2

method: side^2 + side^2 = 14^2 so 2side^2 = 196, side^2 = 98	M1
side = $\sqrt{98}$ = 9.8994949... so 9.90 cm cao	A1

Answer: **9.90 cm**

Question 3

method: $x^2 + x^2 = 10^2 \Rightarrow 2x^2 = 100$	M1
$x^2 = 50$, so $x = \sqrt{50}$	M1
$x = 5\sqrt{2}$ m or 7.07 m to 2 d.p. cao	A1

Answer: **$5\sqrt{2}$ m**

Question 4

method: height^2 = 55^2 - 48^2 = 3025 - 2304 = 721	M1
height = $\sqrt{721}$ = 26.851... cm	M1
height = 268.5 mm -> to nearest mm 269 mm cao	A1

Answer: **269 mm**

Question 5

$7^2 + 3^2 = 58$	M1
$\sqrt{58}$	M1
7.6 cm cao	A1

Answer: **7.6 cm**

Question 6

$12^2 + 16^2$	M1
$\sqrt{400}$	M1
20 km cao	A1

Answer: **20 km**

Question 7

$10^2 - 8^2$	M1
$\sqrt{36}$	M1
6 m cao	A1

Answer: **6 m**

Question 8

$10^2 + 24^2$	M1
$\sqrt{676}$	M1
26 cm cao	A1

Answer: **26 cm**

Question 9

$1^2 + 6^2 = 37$	M1
$\sqrt{37}$	M1
6.1 cao	A1

Answer: **6.1**

Question 10

$15^2 - 12^2$	M1
$\sqrt{81}$	M1
9 m cao	A1

Answer: **9 m**

Question 11

$9^2 + 40^2$	M1
$\sqrt{1681}$	M1
41 km cao	A1

Answer: **41 km**

Question 12

$20^2 - 12^2$	M1
length = 16 cm	A1
2 x (12 + 16)	M1
56 cm cao	A1

Answer: **56 cm**

Question 13

$2^2 + 6^2 = 40$	M1
$\sqrt{40}$	M1
6.3 cao	A1

Answer: **6.3**

Question 14

$2.4^2 + 7^2 = 5.76 + 49 = 54.76$	M1
7.4 cao	A1

Answer: **7.4 m**

Question 15

(a) $45^2 + 28^2 = 2025 + 784 = 2809$	M1
(a) 53 cao	A1
(a) Answer: **53 km**	
(b) 53 / 13	M1
(b) 4.1 cao	A1
(b) Answer: **4.1 hours**	

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