

Name: _____

TOTAL = $\frac{\quad}{60} = \frac{\quad}{100}$

Date: _____

563306 - Mathematics
Unit 1 - Practice Test – Version B

PART 1: MULTIPLE CHOICE (EACH QUESTION IS WORTH 4 MARKS)

1 Which one of the numbers below is a rational number?

4 | 0

A) $\frac{2\pi}{\sqrt{25}}$

B) $(2.5 \cdot \sqrt[3]{4\pi})^2$

C) $\frac{2\sqrt{4}}{\sqrt{10}}$

D) $\frac{\sqrt[3]{54}}{\sqrt[3]{2}}$

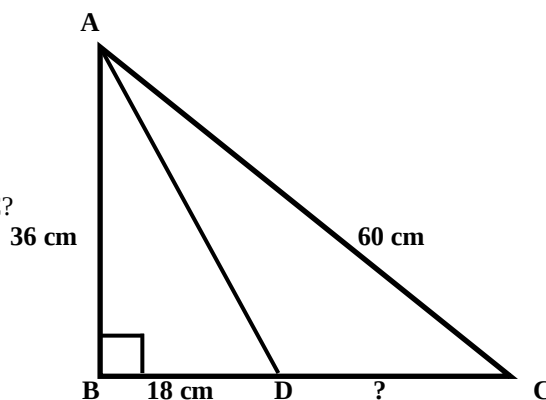
2 Triangle ABC, shown on the right, is a right triangle.

4 | 0

We have:

- Measure of segment AB = 36 cm
- Measure of segment BD = 18 cm
- Measure of segment AC = 60 cm

What is, rounded to the nearest unit, the measure of segment DC?



A) 30 cm

B) 40 cm

C) 48 cm

D) 52 cm

3 The average mass of an elephant is 11 000 000 grams. Which one of the numbers below correctly shows the same number using scientific notation?

4 | 0

A) 11×10^{-6}

B) 1.1×10^7

C) 0.11×10^8

D) 11×10^6

4 Which one of the following expressions is FALSE for any value of a ($a \neq 0$) and b ($b \neq 0$)?

4 | 0

A) $a^4 \times a^3 = a^7$

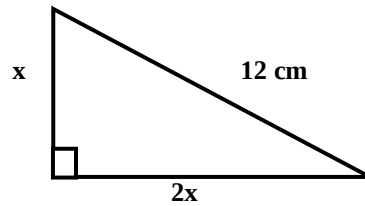
B) $a^8 = a^6 + a^2$

C) $a^{3-3} = 1$

D) $b^{-3} = \frac{b^7}{b^{10}}$

5 Consider the right triangle shown on the right.

4 | 0



What is, rounded to the nearest unit, the area of this triangle?

- A) 16 cm² B) 29 cm²
C) 48 cm² D) 58 cm²

6 If $a \neq 0$ and $b \neq 0$, which expression below is equivalent to the following expression?

4 | 0

$$\frac{(a^{-2}b^{-2})^{-1}}{a^{-1}b^2}$$

- A) $\frac{1}{a}$ B) $\frac{1}{a^3}$
C) $\frac{a^3}{b^4}$ D) a^3

PART 2: SHORT ANSWERS AND CONSTRUCTIONS (EACH QUESTION IS WORTH 4 MARSK)

7 Write the following rational number, $3.0\overline{83}$, as a fraction (a/b) of two integers.

4 | 0

Answer _____

8 Complete the following Pythagorean triple: (25, ?, 65).

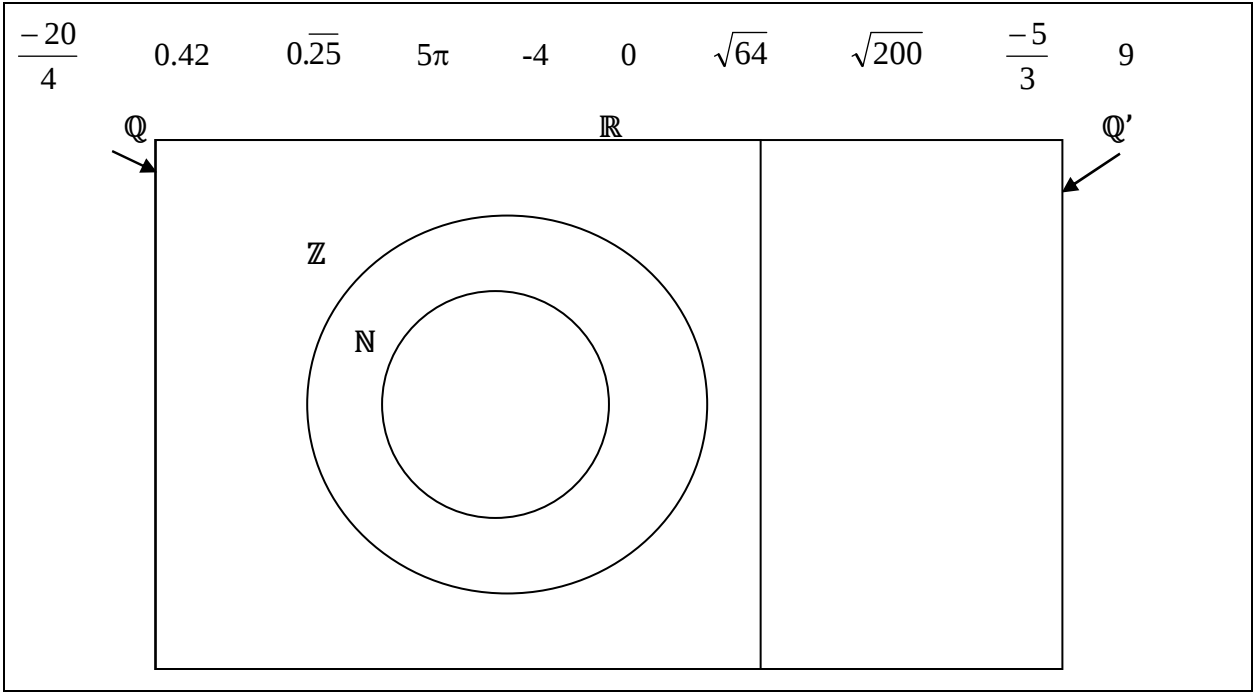
4 | 0

The Pythagorean triple is (25, _____, 65).

9 Complete the following table:

4 | 3 | 2 | 1 | 0

Notation	Set-builder notation	Graphic representation
$] -2, 4[$		
	$\{x \in \mathbb{R} \mid 1 < x \leq 3\}$	
	$\{x \in \mathbb{R} \mid x \geq -2\}$	



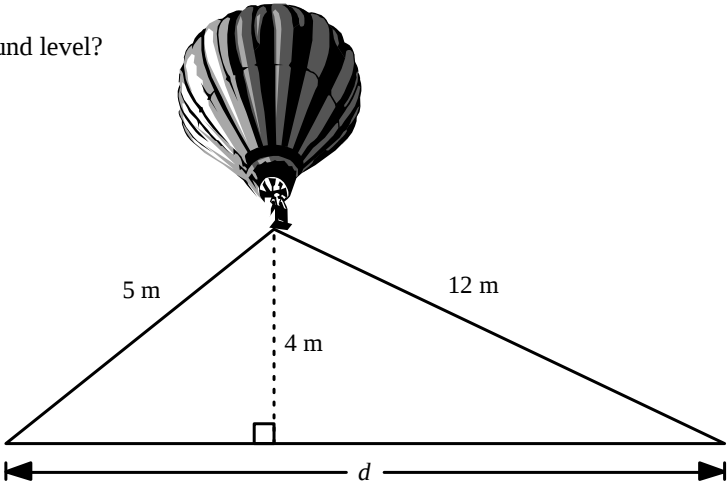
PART 3: EXTENDED ANSWERS (EACH QUESTION IS WORTH 10 MARKS)

- 11
- A hot air balloon is anchored to the ground by two cables, one of which is 5 metres long and the other, 12 metres long. It is 4 metres above the ground.

10	9	8	7	6	5	4	3	2	1	0
----	---	---	---	---	---	---	---	---	---	---

What is the distance "d" between the two cables at ground level?

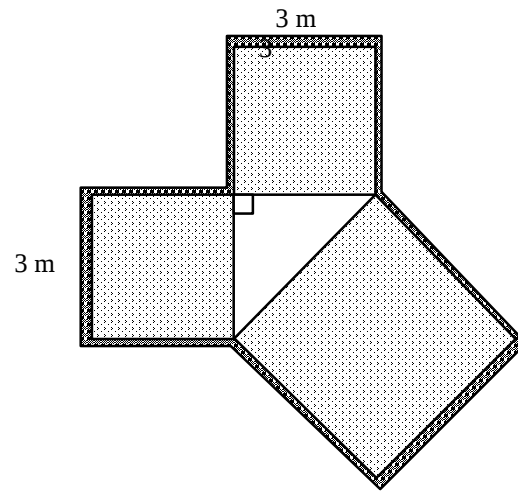
Show all your work.



The distance "d" between the two cables at ground level is _____ m.

12

A kennel owner is planning to put up a fence around the dog run. This part of the kennel is made up of three square grassy areas and one gravelled area that is a right triangle in shape, as shown below. One side of the smaller square grassy areas measures 3 m. Fencing costs \$6 a meter.



How much will the kennel owner spend to enclose the dog run?
Show all your work.

The cost of the fencing is \$_____.

563306 - Mathematics
Unit 1 - Practice Test - Version B
Correction key

1 D

3 B

5 B

2 A

4 B

6 D

7 Work: (example)

1. $n = 3.0833333...$

8

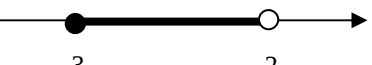
The Pythagorean triple is (25, 60, 65)

2.
$$\begin{array}{r} 1000n = 3083.333... \\ - \quad 100n = 308.3333... \\ \hline \end{array}$$

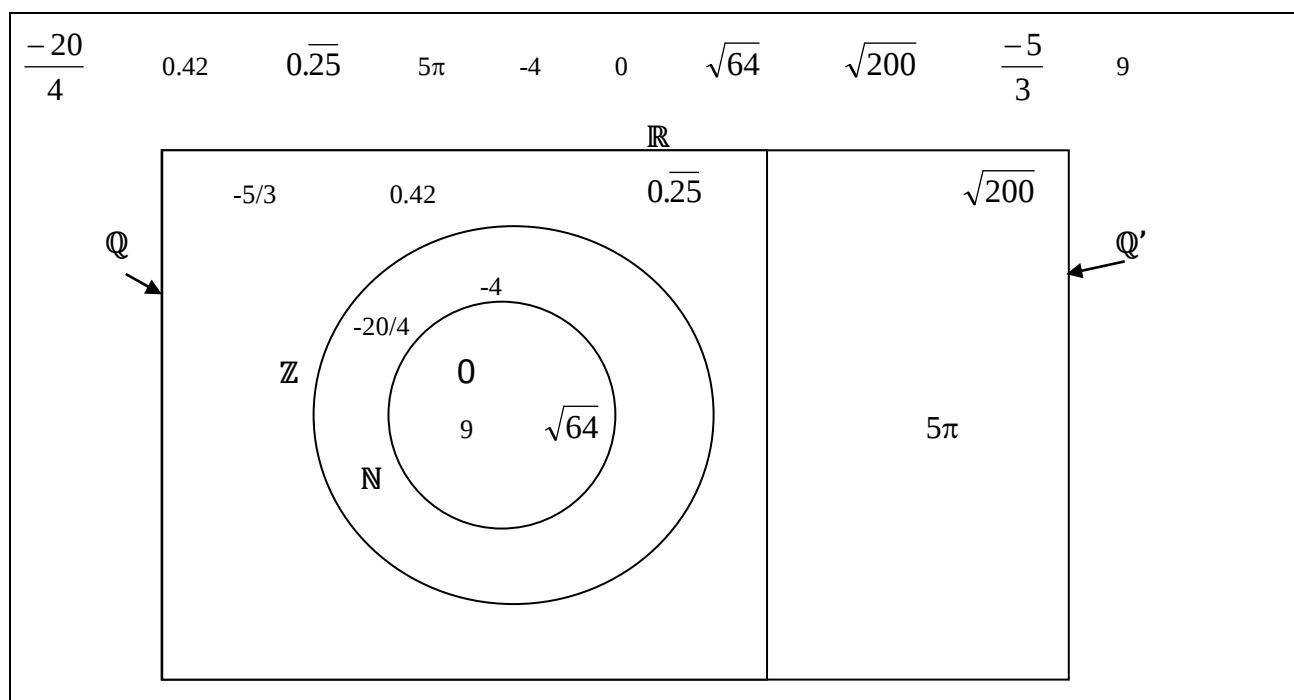
3.
$$\frac{900n}{900} = \frac{2775}{900}$$

4.
$$n = \frac{2775}{900} = \frac{37}{12}$$

9

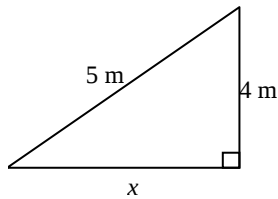
Notation	Set-builder notation	Graphic representation
$] -2, 4[$	$\{x \in \mathbb{R} \mid -2 < x < 4\}$	
$]1, 3]$	$\{x \in \mathbb{R} \mid 1 < x \leq 3\}$	
$[-3, 2[$	$\{x \in \mathbb{R} \mid -3 \leq x < 2\}$	
$[-2, +\infty[$	$\{x \in \mathbb{R} \mid x \geq -2\}$	

10



11

Triangle A



Pythagorean Theorem
(looking for a leg)

$$a = \sqrt{c^2 - b^2}$$

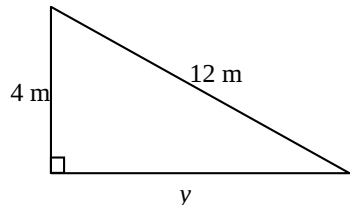
$$a = \sqrt{5^2 - 4^2}$$

$$a = \sqrt{25 - 16}$$

$$a = \sqrt{9}$$

$$a = 3 \text{ m}$$

Triangle B



Pythagorean Theorem
(looking for a leg)

$$a = \sqrt{c^2 - b^2}$$

$$a = \sqrt{12^2 - 4^2}$$

$$a = \sqrt{144 - 16}$$

$$a = \sqrt{128}$$

$$a \approx 11.31 \text{ m}$$

Distance between the cables: $3 + 11.31 \approx 14.31$

Answer: The distance "d" between the two cables at ground level is ≈ 14.31 metres.

12

Side S of the large square is the hypotenuse of the right triangle (so $S = c$)

Pythagorean Theorem $c = \sqrt{a^2 + b^2}$ $c = \sqrt{3^2 + 3^2}$ $c = \sqrt{9 + 9}$ $c = \sqrt{18}$ $c \approx 4.24 \text{ m}$

Length P of the fence comprises one side of each of the 3 squares

$$P \approx 3(4.24 \text{ m}) + 3(3 \text{ m}) + 3(3 \text{ m}) \approx 30.73 \text{ m}$$

Cost of the fence

$$\approx 30.73 \text{ m} \times \$6/\text{m} \approx \$184.37$$

Answer: The cost of the fencing is \$184.37