

IB Physics Maths Aptitude Test

June 2019

Suggested time: 50 Minutes

However you can take the time need to to finish

Non-Calculator



This test is designed to examine your problem solving skills. You are encouraged to try and solve every question rather than manage your time.

It is designed to take 50 minutes if you are proficient, but you may take longer within reason*. If you need more time you can have more time.

*This is at the discretion of the examiner but should is suggested to be less than 2 hours

Name:

Marks:

/40

GCSE Maths Course:

0580 or 0607

IB maths course:

Analysis or Applications

HL or SL

1 Solve the simultaneous equations.

$$2x + y = 18$$

$$x - y = 6$$

[3 marks]

2 Density = $\frac{\text{mass}}{\text{volume}}$

The mass of solid A is 6 times the mass of solid B.

The volume of solid A is 3 times the volume of solid B.

Complete the sentence.

[1 mark]

The density of solid A is _____ times the density of solid B.

3 x km/h = y mph

Use 8 km/h = 5 mph to write a formula for y in terms of x .

[2 marks]

4 Billy wants to buy these tickets for a show.

4 adult tickets at £15 each

2 child tickets at £10 each

A 10% booking fee is added to the ticket price.

3% is then added for paying by credit card.

Work out the **total** charge for these tickets when paying by credit card.

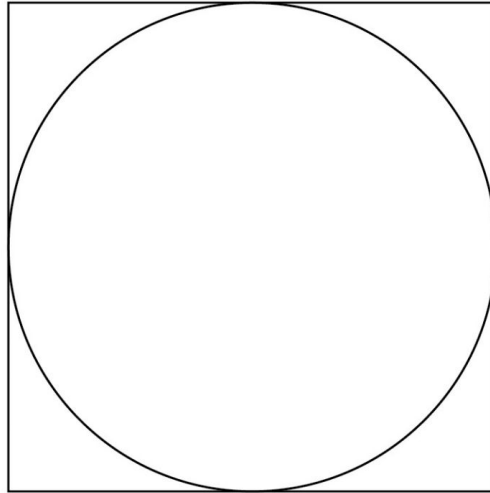
[5 marks]

5 Work out $\sqrt{12\frac{1}{4}}$ as an improper fraction.

[1 mark]

6

Here is a circle touching a square.



Not drawn accurately

The area of the square is 64 cm^2

Work out the area of the circle.

Give your answer in terms of π .

[3 marks]

7

Work out $\sqrt[3]{16}$ as a power of 2

[2 marks]

8 Expand and simplify $(x - 4)(2x + 3y)^2$

[4 marks]

9 Simplify

$$2 \div \frac{3^{-2}}{5a^2}$$

[3 marks]

Your answer should be given in terms of a

10 Make k the subject

$$x + c = \frac{4a^b}{\sqrt{3-k}}$$

[3 marks]

11 Work out $2\frac{3}{4} \times 1\frac{5}{7}$

[3 marks]

12 $a = \frac{b+c}{d^2}$ $e = 10d + k$ $k = g^2 + h^3$

Use the above formulas to prove that if

$$e = 100 \quad g = \sqrt{2} \quad h = 2$$

Then

$$c = 81a - b$$

[4 marks]

13 Convert 5.5m^2 into mm^2

[2 marks]

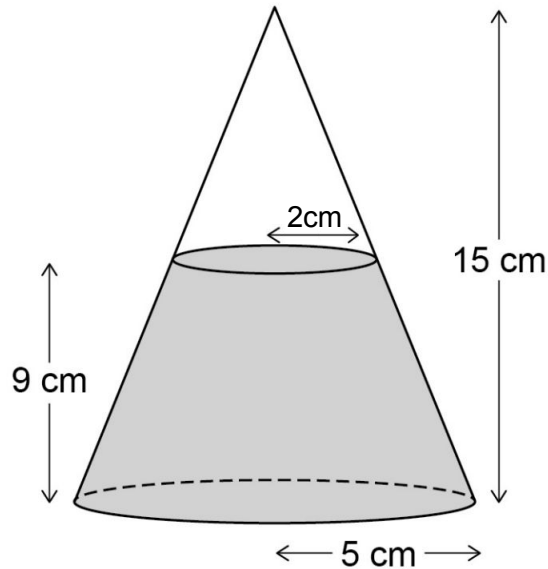
- 14 Volume of cone = $\frac{1}{3}\pi r^2 h$ where r is the radius and h is the perpendicular height.

A cone has a

horizontal base of radius 5 cm

height of 15 cm

The cone contains water to a depth of 9 cm



Work out the volume of the water, in cm^3

Give your answer in terms of π .

[4 marks]