

# Mathematics A

## Paper One — Resource book

Thursday 25 October 2018

9 am to 12:10 pm

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### Directions

You may write in this book during perusal time.

### Contents

- Formulas

### After the examination session

Take this book when you leave.



## Area

### Circle

$$A = \pi r^2$$

$r$  = radius of the circle

### Triangle

$$A = \frac{1}{2}bh$$

$b$  = base length

$h$  = perpendicular height

### Parallelogram

$$A = bh$$

$b$  = base length

$h$  = perpendicular height

### Trapezium

$$A = \frac{1}{2}h(a+b)$$

$a$  and  $b$  are parallel sides

$h$  = perpendicular height

### Sector

$$A = \frac{\theta}{360} \times \pi r^2$$

$\theta$  = number of degrees in the central angle

### Circumference of a circle

$$C = \pi D$$

$D$  = diameter

### Sphere

$$SA = 4\pi r^2$$

### Closed cylinder

$$SA = 2\pi rh + 2\pi r^2$$

## Volume

$r$  = radius of base

$h$  = perpendicular height

$A$  = base area

### Cone

$$V = \frac{1}{3}\pi r^2 h$$

### Sphere

$$V = \frac{4}{3}\pi r^3$$

### Cylinder

$$V = \pi r^2 h$$

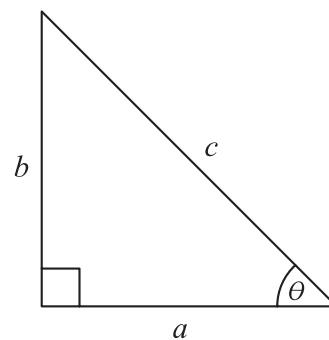
### Pyramid

$$V = \frac{1}{3}Ah$$

### Prism

$$V = Ah$$

## Trigonometry



$$\sin \theta = \frac{b}{c}, \quad \cos \theta = \frac{a}{c} \quad \text{and} \quad \tan \theta = \frac{b}{a}$$

Pythagoras' theorem:  $c^2 = a^2 + b^2$

## Financial formulas

### Simple interest

$$I = P r n$$

$P$  = initial quantity

$r$  = percentage interest rate per period  
expressed as a decimal

$n$  = number of periods

### Compound interest

$$A = P(1+r)^n$$

$A$  = final balance

$P$  = initial quantity

$r$  = percentage interest rate per compounding  
period expressed as a decimal

$n$  = number of compounding periods

### Diminishing value formula

$$S = V_0(1-r)^n$$

$S$  = salvage value of an asset after  $n$  periods

$V_0$  = initial value of asset

$r$  = percentage interest rate per period  
expressed as a decimal

$n$  = number of periods

### Percentage dividend

$$\frac{\text{Dividend per share}}{\text{Face value of share}} \times 100$$

### Percentage yield

$$\frac{\text{Dividend per share}}{\text{Market price per share}} \times 100$$

## Earth geometry

### Great circle distance

Angle difference  $\times$  111.2 km

Angle difference  $\times$  60 nautical miles

### Time

1° longitude difference = 4 minutes time difference

### Navigation

1 nautical mile = 1.852 km



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