

# Mathematics A

2018 Senior External Examination — Subject notice 1

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## Information about the 2018 examination

The examination will be based on the *Mathematics A Senior External Syllabus 2006*. It will consist of two papers.

Candidates must sit both papers. They should attempt every question in each paper. No alternative arrangements will be made if a candidate fails to attend a scheduled examination. No level of achievement can be awarded unless all examination papers are sat.

Paper	Perusal/planning time	Working time
One	10 minutes	3 hours
Two	10 minutes	3 hours

Each paper will contain four extended-response questions.

The following syllabus topics will be assessed.

### Paper One

- Managing money 1
- Elements of applied geometry
- Exploring and understanding data
- Maps and compasses — Navigation

### Paper Two

- Managing money 2
- Introduction to data and its presentation
- Linking two and three dimensions
- Operations research — networks and queuing

### Other information

- A resource book containing formulas will be provided with each paper. These formulas are attached.
- Candidates may improve their *Knowledge and procedures* grade (and their final result) through showing working in responses to *Modelling and problem solving* questions.
- Candidates should prepare for all topics and subject matter listed in the syllabus.

## Level of achievement

Candidate responses to questions in each paper will be judged against the three syllabus exit criteria:

- *Knowledge and procedures (KP)*
- *Modelling and problem solving (MP)*
- *Communication and justification (CJ).*

Each candidate's level of achievement will be determined by applying the syllabus standards to an overall assessment of responses across both Paper One and Paper Two.

## Enquiries

Telephone (07) 3120 6180 or email [externalexams@qcaa.qld.edu.au](mailto:externalexams@qcaa.qld.edu.au).

# Formulas

## 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

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

### Closed cylinder

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

## 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

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

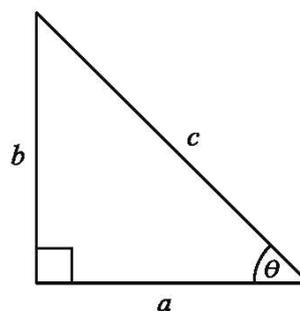
### Pyramid

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

### 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

$$\text{Angle difference} \times 111.2 \text{ km}$$

$$\text{Angle difference} \times 60 \text{ nautical miles}$$

### Time

$$1^\circ \text{ longitude difference} = 4 \text{ minutes time difference}$$

### Navigation

$$1 \text{ nautical mile} = 1.852 \text{ km}$$