Information about the 2015 examination

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

<table>
<thead>
<tr>
<th>Paper</th>
<th>Perusal/planning time</th>
<th>Working time</th>
</tr>
</thead>
<tbody>
<tr>
<td>One</td>
<td>10 minutes</td>
<td>3 hours</td>
</tr>
<tr>
<td>Two</td>
<td>10 minutes</td>
<td>3 hours</td>
</tr>
</tbody>
</table>

Each paper will contain four extended-response questions.

The following syllabus topics will be assessed.

**Paper One**
- Managing money 1
- Introduction to data and its presentation
- Exploring and understanding data
- Maps and compasses — navigation.

**Paper Two**
- Managing money 2
- Elements of applied geometry
- Linking two and three dimensions
- Operations research — networks and queuing.

**Assessment**

Candidates should attempt every question in each paper.

Candidates' responses to questions in each paper will be judged against the syllabus exit criteria:
- *Knowledge and procedures (KP)*
- *Modelling and problem solving (MP)*
- *Communication and justification (CJ)*.

For each candidate, a level of achievement will be determined by applying the syllabus standards to an overall assessment of responses across both Paper One and Paper Two.
Formulas
A resource book containing formulas will be provided with each paper. These formulas are attached.

Enquiries
Telephone (07) 3864 0211 or email externalexams@qcaa.qld.edu.au.
Formulas

Area

Circumference of a circle
\[ C = \pi D \]
\[ D = \text{diameter} \]

Area of a circle
\[ A = \pi r^2 \]
\[ r = \text{radius of the circle} \]

Area of a triangle
\[ A = \frac{1}{2}bh \]
\[ b = \text{base length} \]
\[ h = \text{perpendicular height} \]

Area of a parallelogram
\[ A = bh \]
\[ b = \text{base length} \]
\[ h = \text{perpendicular height} \]

Area of a trapezium
\[ A = \frac{1}{2}h(a + b) \]
\[ a \text{ and } b \text{ are parallel sides} \]
\[ h = \text{perpendicular height} \]

Area of a sector
\[ A = \frac{\theta}{360} \times \pi r^2 \]
\[ \theta = \text{number of degrees in the central angle} \]

Sphere
\[ A = 4\pi r^2 \]

Closed cylinder
\[ A = 2\pi rh + 2\pi r^2 \]

Volume

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

\[ \sin \theta = \frac{b}{c}, \cos \theta = \frac{a}{c} \text{ and } \tan \theta = \frac{b}{a} \]

Pythagoras’ theorem: \[ c^2 = a^2 + b^2 \]
Financial formulas

Simple interest
\[ I = P r n \]
\[ P = \text{initial quantity} \]
\[ r = \text{percentage interest rate per period expressed as a decimal} \]
\[ n = \text{number of periods} \]

Compound interest
\[ A = P(1 + r)^n \]
\[ A = \text{final balance} \]
\[ P = \text{initial quantity} \]
\[ r = \text{percentage interest rate per compounding period expressed as a decimal} \]
\[ n = \text{number of compounding periods} \]

Diminishing value formula
\[ S = V_0(1 - r)^n \]
\[ S = \text{salvage value of an asset after } n \text{ periods} \]
\[ V_0 = \text{initial value of the asset} \]
\[ r = \text{percentage interest rate per period expressed as a decimal} \]
\[ n = \text{number of periods} \]

Percentage dividend
\[ \frac{\text{Dividend per share}}{\text{Par value of share}} \times 100 \]

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

Navigation
\[ 1 \text{ nautical mile} = 1.852 \text{ km} \]