

Mathematics A

Paper One — Resource book

Monday 28 October 2019

9 am to 12:10 pm

Directions

Do not write during perusal time.

Contents

- Formulas

After the examination session

The supervisor will collect 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

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

θ = 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

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

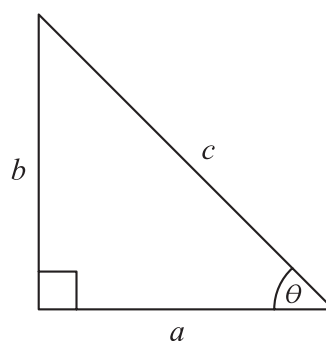
Pyramid

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

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

$$I = Prn$$

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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Manager

Publishing Unit

Email: publishing@qcaa.qld.edu.au

Queensland Curriculum & Assessment Authority

PO Box 307, Spring Hill QLD 4004 Australia

Level 7, 154 Melbourne Street, South Brisbane

T +61 7 3864 0299

www.qcaa.qld.edu.au