Multiple-Choice Tasks – Sample questions

Year 9 Tasks

1. **Money and Financial Mathematics**
   Solving problems involving simple interest, profit, loss, percentages, income tax, business tax, GST, rent, stocks and shares, price to earnings ratios, commission and depreciation

2. **Pythagoras' Theorem**
   Using Pythagoras' Theorem to find unknown lengths in right-angled triangles, understanding that results can be integers, fractions or irrational numbers, recognising Pythagorean triples and using multiples of Pythagorean triples, applying Pythagoras' Theorem to solve problems in two and three dimensions

3. **Algebra**
   Applying index laws to numerical expressions and variables using integer indices, expressing and manipulating numbers in scientific notation, applying the distributive law to the expansion of binomial products, including perfect squares and difference of perfect squares, collecting like terms where appropriate, identifying algebraic factors in algebraic expressions, factorising monic quadratic expressions, factorising by grouping in pairs

4. **Measurement**
   Calculating the areas of composite shapes, solving problems involving the surface area and volume of right prisms, calculating the surface area and volume of cylinders and solving related problems, investigating very small and very large time scales and intervals

5. **Linear Relationships**
   Finding the distance between two points on a Cartesian plane, finding the midpoint and gradient of a line segment (interval) on the Cartesian plane, finding the rule for a linear graph given two points or one point plus the gradient, solving linear equations

6. **Geometric Reasoning**
   Using the enlargement transformation to explain similarity and develop the conditions for triangles to be similar, solving problems using ratio and scale factors in similar figures, understanding the relationship between areas of similar figures and the ratio of corresponding sides (scale factor)

7. **Trigonometry**
   Using similarity to investigate the constancy of the sine, cosine and tangent ratios for a given angle in right-angled triangles, applying trigonometry to solve right-angled triangle problems

8. **Probability and Statistics**
   Assigning probabilities to outcomes and determining probabilities for events in experiments, both with and without replacement, using tree diagrams or arrays, calculating relative frequencies from given data to estimate probabilities, interpreting back-to-back stem-and-leaf plots and histograms, describing data in terms of symmetric, skewed and bimodal, comparing data in terms of location and spread, using mean, median and range

9. **Non-linear Relationships and Proportion**
   Graphing non-linear relations such as parabolas and circles and solving related equations, solving problems involving direct proportion, exploring the relationship between graphs and equations corresponding to simple rate problems

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Multiple-Choice Tasks – Sample questions

Year 9: Money and Financial Mathematics

Question 15
Kane paid $3,572 tax on his last year's income. This represented a tax rate of 19 cents for each dollar above the tax-free threshold of $18,200. The number of dollars above the tax-free threshold earned by Kane last year was
A $17,860
B $20,000
C $19,000
D $18,200
E $18,800

Year 9: Pythagoras' Theorem

Question 1
In a right-angled triangle, which one of the following statements is **not** true?
A   The hypotenuse is always the longest side
B   The square of the length of the hypotenuse is always equal to the sum of the squares of the lengths of the other two sides
C   The hypotenuse is always opposite the right angle
D   Two of the internal angles are always acute
E   One side is always shorter in length than the other two sides

Year 9: Algebra

Question 6
$$\frac{(3t)^0 - 5u^0}{\left(7v^0 - (2w)^0\right)^0} =$$
A   1
B $-\dfrac{2}{5}$
C   0
D   −2
E   −4

Year 9: Measurement

Question 20
The total surface area of a cylinder is 676π cm^2. If the radius of the cylinder is equal to its height then the height of the cylinder, in cm, is
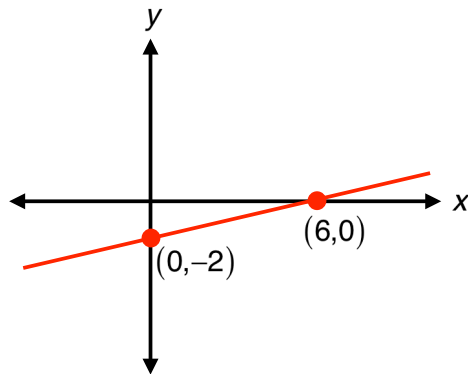**A**   26
B   15
C   13
D   17
E   12

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Multiple-Choice Tasks – Sample questions

Year 9: Linear Relationships

Question 14

The equation of the above straight-line graph is

A $x - 3y = 6$

B $y = 3x - 2$

C $3y - x = 6$

D $y = \dfrac{1}{3}x + 2$

E $y = -\dfrac{1}{3}x - 2$

Year 9: Geometric Reasoning

Questions 7 to 9 relate to the following information
A square of side length 5 cm is enlarged by a scale factor of 5

Question 9
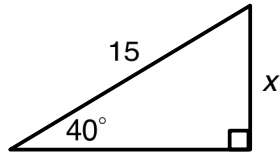The length of the diagonal of the square's image, in cm, is

A   50

B $25\sqrt{2}$

C   25

D   10

E $5\sqrt{2}$

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Multiple-Choice Tasks – Sample questions

Year 9: Trigonometry

Question 12

$x =$

A $15\cos\left(40°\right)$

B $15\sin\left(40°\right)$

C $\dfrac{15}{\cos\left(40°\right)}$

D $15\tan\left(40°\right)$

E $\dfrac{15}{\tan\left(40°\right)}$

Year 9: Probability and Statistics

Question 13
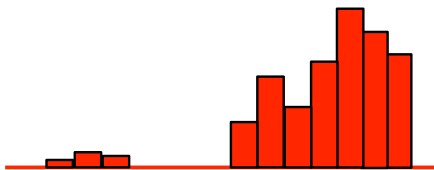
The data displayed in the above histogram
A   has no mode
B   is symmetrical
C   is bimodal
D   is negatively skewed
E   is positively skewed

Year 9: Non-linear Relationships and Proportion

Question 4
The equation of the circle with centre the origin and diameter 12 is
A $x^2 + y^2 = 144$
B $x^2 + y^2 = 36$
C $x^2 + y^2 = 12$
D $x^2 + y^2 = 6$
E $x^2 + y^2 = \sqrt{12}$

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