N5 Mathematics

Relationships

Practice Assessment 3

Relationships Assessment Standard 1.1

1 A straight line with gradient -5 passes through the point $(-1, 9)$.

Determine the equation of this straight line in its simplest form. **(2)**

2 Solve the inequation $6p - 19 < p - 1$. **(3)**

3 The Koizumi family visit a new attraction in Aberdeen.
They paid £ $35 \cdot 55$ for 5 adult tickets and 3 child tickets.

Write an equation to represent this information. **(#2.1)**

4 Solve the following system of equations algebraically :

$$\begin{aligned} 5a + 4b &= 42 \\ a - b &= 3 \end{aligned}$$

(3)

5 This formula is used to convert temperature from degrees Réaumur (^{o}Ré) to degrees Rømer (^{o}Rø) :

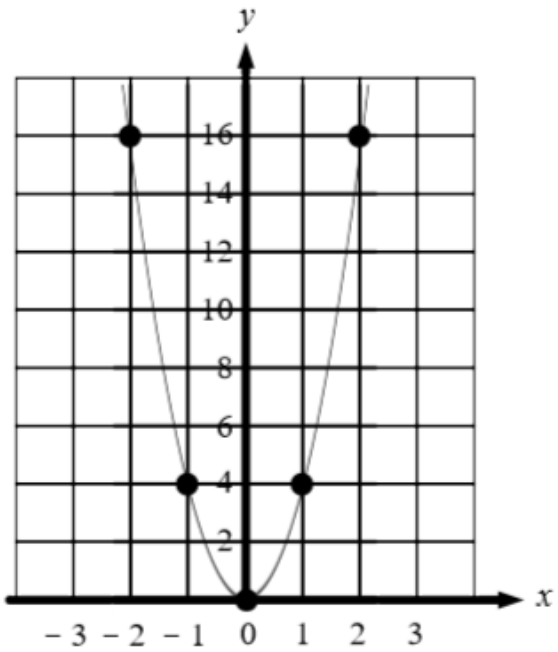
$$\text{Rø} = \frac{21\,\text{Ré}}{32} + 7 \cdot 5$$

Change the subject of the formula to Ré. **(3)**

Relationships Assessment Standard 1.2

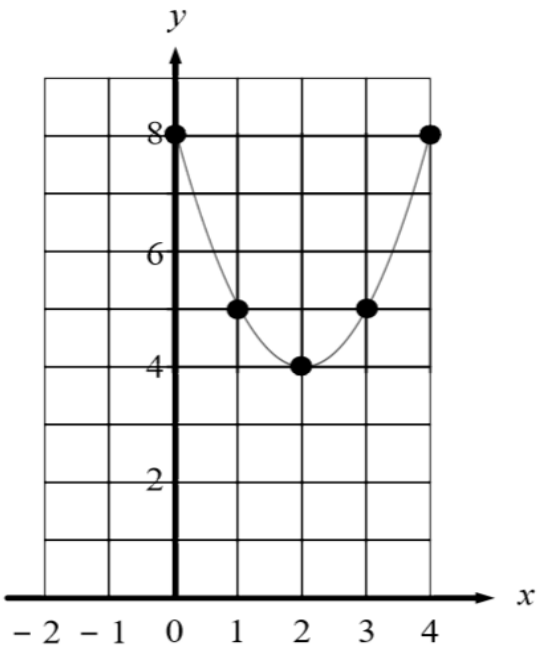
6 The diagram shows the parabola with equation $y = k x^2$.

What is the value of k ? **(1)**



7 The equation of the quadratic function whose graph is shown below is of the form $y = (x + a)^2 + b$, where a and b are integers.

Write down the values of a and b. **(2)**



8 Sketch the graph $y = (x + 9)(x - 1)$ on plain paper.

Mark clearly where the graph crosses the axes and state the coordinates of the turning point. **(3)**

9 A parabola has equation $y = (x - 1)^2 - 6$.

(a) Write down the equation of its axis of symmetry. **(1)**

(b) Write down the coordinates of the turning point on the parabola and state whether it is a maximum or minimum. **(2)**

Relationships Assessment Standard 1.3

10 Solve the equation $(x - 5)(x + 9) = 0$. **(1)**

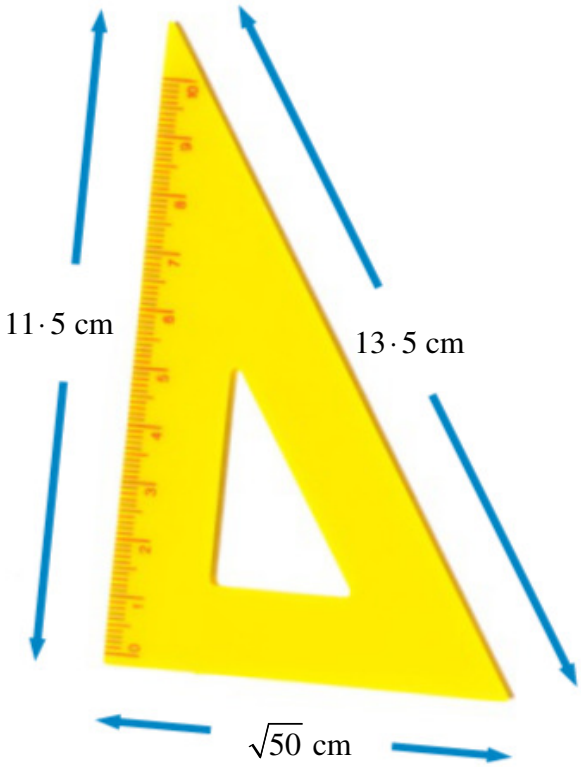
11 Solve the equation $x^2 + 4x - 8 = 0$, giving the roots correct to one decimal place. **(4)**

12 Determine the number of roots of the equation $2x^2 + 5x - 12 = 0$. **(2)**

Relationships Assessment Standard 1.4

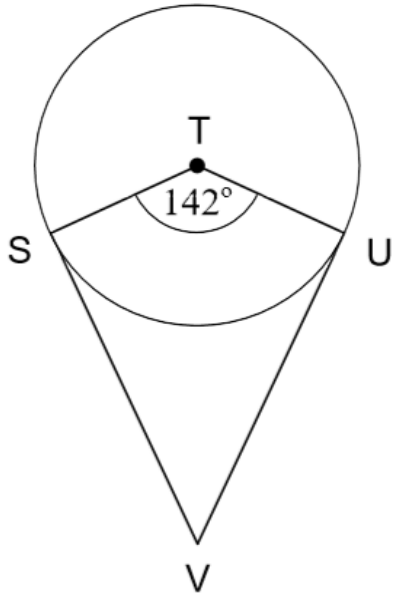
13 To pass quality control inspections, this set-square must have a perfect right-angle. All necessary measurements are given in the diagram.

Use the Converse of Pythagoras' Theorem to determine whether this set-square passes quality control inspections. **(2 and #[2.2])**



14 The diagram below shows the design stages of a kite. Kite STUV and a circle with centre T are detailed in the diagram.

SV is the tangent to the circle at S and UV is the tangent to the circle at U.



Given that angle STU is 142^{o}, calculate angle SVU. **(3)**

15 An Olympic torch used in 2000 is 1 000 mm long. The volume of fuel stored in the tank of an Olympic torch is 64 000 cm^3.

A similar version is 225 mm long.

Calculate how much fuel is needed for a miniature Olympic torch. **(3)**

Relationships Assessment Standard 1.5

16 Sketch the graph of $y = 5\cos x^{\circ}$ for $0 \leq x \leq 360$. **(2)**

17 Write down the period of the graph with equation $y = \cos 6x^{\circ}$. **(1)**

18 Solve the equation $3\tan x^{\circ} - 1 = 0$ for $0 \leq x \leq 360$. **(3)**