

4. Put the following into English:—
 E hoa, he aha te mea e iri mai ra?
 Ko wai ma anake era e titiro iho ra kia tatou?
 I hoki rawa mai koe i hea?
 Katahi nei ano au ka tae mai.
 Kahore ano kia ata maoa te kai.
 I tatari au ki a koe a po noa.
5. Write a letter to the Native Minister in Maori, telling him what Maori tribes you know, and giving a description of the districts in which they live; also what their principal food consists of, and how obtained.

TRIGONOMETRY.

1. What is meant by trigonometry? What difference do we observe between the definitions of an angle in geometry and trigonometry? What are we to understand by the signs + and — when prefixed to the algebraical expression for an angle?
2. Show how to find the number of grades, minutes, and seconds in an angle expressed in circular measure. In a circle whose radius is 3 yards an angle at the centre is subtended by an arc of 3 feet: what is its circular measure, and its measure in grades?
3. The tangent of an angle is $\frac{3}{4}$: find all the other trigonometrical ratios.
4. Find an expression for the tangent of the sum or difference of two angles in terms of the tangents of those angles. If $\tan \theta = \frac{1}{4}$, what is the value of $\cot \left(\frac{\pi}{4} + \theta \right)$?
5. Simplify—
 $\sin (\pi + \theta) \cos (2\pi - \theta) + \cos \left(\frac{\pi}{2} + \theta \right) \sin \left(\frac{3\pi}{2} + \theta \right) + \tan (\pi + \theta) \tan \left(\frac{3\pi}{2} - \theta \right).$
6. Prove the following:—
 (i.) $\frac{1}{2} \cos (A - 2B) - \frac{1}{2} \cos (2A + B) = \sin \left(A + \frac{1}{2} \overline{A - B} \right) \sin \left(B + \frac{1}{2} \overline{A + B} \right).$
 (ii.) $\sin A \cos A + B - \cos A \sin A - B = \cos 2A \sin B.$
 (iii.) $\cot \frac{3}{2} A \cot \frac{1}{2} A = \frac{\cos A + \cos 2A}{\cos A - \cos 2A}.$
 (iv.) $\sin (A + B) \sin (B + C) = \sin A \cdot \sin C + \sin B \cdot \sin (A + B + C).$
7. Find the area of a parallelogram when the adjacent sides are 35 and 45 feet, and the included angle $37\frac{1}{2}^\circ$.
8. Solve the triangle—
 $AB = 317.92$ feet.
 $BAC = 32^\circ 17' 39''.$
 $ABC = 51^\circ 42' 10''.$
9. Two men are surveying, and when each is at a distance of 100 yards from the flagstaff one of them finds the angle between it and the other's position to be $39\frac{1}{2}^\circ$: how far are they apart?
10. The length of a road in which the ascent is 1 in 5 is $1\frac{1}{2}$ miles from the foot of the hill to the top: what will be the length of a road up the same hill in which the ascent shall be 1 in 12?
11. In order to measure the distance between two inaccessible objects, C and D, I measured a base-line, AB., of 200 yards, and at its extremities determined the following angles:—
 $CAB = 94^\circ 13', DAB = 62^\circ 20'.$
 $DBA = 84^\circ 58', CBA = 41^\circ 16'.$
 Find the distance between C and D.

ALGEBRA.

1. Explain a *simple expression*, a *homogeneous expression*, *like terms*, *factors*, *coefficients*, *indices*, *surds*. Give examples.
2. If $a = 2$, and $x = -\frac{1}{2}$, find the value of $\frac{2x^2 - ax}{a^3 - x^3}.$
3. Divide $a^{\frac{3}{2}} - b^{\frac{3}{2}}$ by $a^{\frac{1}{2}} - b^{\frac{1}{2}}.$
4. Reduce $\frac{3a^2}{a^3 - x^3}, \frac{2a^2}{a - x},$ and $\frac{a^2 + x^2}{a^2 + ax + x^2}$ to their equivalents with common denominators.
5. Extract the square root of $\frac{a^3}{4} + 3ab - ac + \frac{a}{4} + 9b^2 - 6bc + \frac{5b}{4} + c^2 - \frac{c}{2} + \frac{1}{16}.$
6. Expand $(a+b)^6.$
7. Solve the following equations:—

$$\frac{2}{3x} + \frac{3}{2x} = \frac{1}{6}$$

$$\begin{cases} \frac{11x - 5y}{11} = \frac{3x + y}{16} \\ 8x - 5y = 1. \end{cases}$$

$$\frac{x^2 - 5x}{x + 3} = x - 3 + \frac{1}{x}.$$
8. Eight times a number diminished by 15 is equal to the square of a number: find it.
9. Having spent a third of his life in England, a man travelled on the Continent for 6 months; then went to India, where he spent a twelfth of his life; had another cruise for 6 months, and settled down in Victoria for $7\frac{1}{2}$ years; went to Tasmania for 18 months; and finally came to New Zealand, where he died after being here for as long as he had been in England, on the Continent, and in Victoria. How old was he when he died?