

return to his pa as evening came on. While he lived in this way there was very little chance of his getting fever or any complaint of that kind; he was ill often enough, perhaps, but not from that sort of disease. This kind of life was found to be troublesome, no doubt, but the Maori had to live in that way if he wished to escape death.

Now all this is changed: the Maori is safe by day and by night; he has no longer to protect himself, the law protects him; there is no fear of his being attacked and killed by a hostile tribe, and no reason why he should gather his crop into a stronghold as soon as possible.

3. Put the following into Maori:—

The largest of these sheep was brought from Makara. By whom was Pita's raupo house built? What are you doing to-day? He was taking care of the sheep. If he had seen the dog that worried the sheep he would have killed it. That horse of Hemi's was stolen during the night. If my house had not been burnt you should have been my guests (guests for me). I spoke to a man on the beach to-day. I said to him, "What is your name?" He said, "Hoani." I have been deceived by one of these men; I do not know which. This is the boy who carried your letters and parcels; he is a good boy. What are the names of the men who threshed your wheat? Do you remember when it was that I gave the black horse to John?

4. Put the following into English:—

He aha tau rakau e whakato na? Naku te kuri nei. I whanau au ki te Waimate. Ko te wahi tera i noho ai matou ki te kai. Mutu rawa tana whangai i nga hoiho, kua po. He tamariki rawa a Hoani i te matenga o tona papa. I tawahi o Waikanae te whare i noho ai a Hoani. I ra uta mai ranei a Tame i tona haerenga mai i Whangahui? I haere atu Te Kawana ki tawahi i nga ra timatanga o te raumati nei. Ekore au e tae wawe atu.

5. Give examples of adjectives used adverbially, and of nouns carrying the termination of a passive verb (all examples to be translated). Correct the mistakes in the following sentences: Tenei ahau ko to koutou hoa te mea nei. Tiakina to tatou kainga ko Karori. Kua kainga koutou te puwha. Haere koe ana ki hea apopo.

6. Write, in Maori, giving an account of floods that have occurred in your district; enumerate losses incurred by the Natives, and picture the distress that they are in for want of food, and ask for assistance in procuring seed for the coming season. Translate your statement into English.

*Trigonometry.—For Senior Civil Service. Time allowed: 3 hours.*

1. Define the sine, cosine, and tangent of an angle. Prove that—

$$(1.) \tan A \cdot \cos A = \sin A;$$

$$(2.) \sin^2 A + \cos^2 A = 1.$$

Given  $\tan A = \sqrt{3}$ , find the values of the other trigonometrical functions.

2. Find the values of the sine, cosine, and tangent of angles of  $30^\circ$ ,  $45^\circ$ ,  $60^\circ$ , and  $75^\circ$ .

3. If  $A$ ,  $B$ , and  $A + B$  be each less than a right angle, prove that—

$$\cos(A + B) = \cos A \cdot \cos B - \sin A \cdot \sin B.$$

4. Prove that—

$$(1.) \sin 3\theta \cdot \sin 5\theta + \sin \theta \cdot \sin 9\theta = \sin 4\theta \cdot \sin 6\theta;$$

$$(2.) \sin A + \sin B + \sin C - \sin(A + B + C) = 4 \sin \frac{B+C}{2} \cdot \sin \frac{C+A}{2} \cdot \sin \frac{A+B}{2}.$$

5. Find the values of  $\theta$  which satisfy the equations,—

$$(1.) \sin 3\theta = \cos 2\theta;$$

$$(2.) 3 \tan^2 \theta - 4 \sin^2 \theta = 1.$$

In (1) find all the angles which satisfy the equation, and hence find the values of  $\sin 18^\circ$  and  $\sin 54^\circ$ .

6. Prove that in any triangle—

$$(1.) \frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c};$$

$$(2.) \cos A = \frac{b^2 + c^2 - a^2}{2bc}.$$

The sides of a triangle are 1, 2,  $\sqrt{7}$ : find the greatest angle.

7. Given  $B = 45^\circ$ ,  $b = 140.5$ ft.,  $a = 170.6$ ft., find  $A$  and  $C$ ; having given  $\log 1.405 = .1476763$ ,  $\log 1.706 = .2319790$ ,  $\log 2 = .3010300$ ,  $L \sin 59^\circ 9' = 9.9337467$ ,  $L \sin 59^\circ 10' = 9.9338222$ .

8. Prove that—

If  $s = \frac{1}{2}(a + b + c)$ , the area of a triangle can be expressed as  $\sqrt{s(s-a)(s-b)(s-c)}$ .

Given  $a = 5$ ,  $b = 12$ ,  $c = 13$ , find the area of the triangle. Find also the greatest angle, and the radius of the circumcircle.

9.  $AB$  is a horizontal base, of 100ft. length, measured along the bank of a river.  $C$  is the foot, and  $D$  the top, of a church tower on the other side of the river. The angle  $ABC$  is  $60^\circ$ ,  $BAC$  is  $75^\circ$ , and  $DAC$  is  $15^\circ$ . Find the distance of the tower from the line  $AB$ , and also its height. Calculate both results to inches.

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