

See back cover for an English
translation of this cover

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L2-PHYSMR



NEW ZEALAND QUALIFICATIONS AUTHORITY
MANA TOHU MĀTAURANGA O AOTEAROA

Ahupūngao, Kaupae 2, 2014

2.00 i te ahiahi Rātū 18 Whiringa-ā-rangi 2014

PUKA RAUEMI
MŌ 91170M, 91171M, ME 91173M

Tirohia tēnei puka hei whakautu i ngā pātai i ō pukapuka Pātai, Whakautu hoki.

Tirohia mehemea kei roto nei ngā whārangi 2–3 e raupapa tika ana, ā, kāore hoki he whārangi wātea.

KA TAEA TĒNEI PUKA TE PUPURI HEI TE MUTUNGA O TE WHAKAMĀTAUTAU.

Tērā pea e āwhina ēnei ture i a koe.

91170M Te whakaatu māramatanga ki te ngaru

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i} \quad s_i s_o = f^2 \quad \text{rānei}$$

$$m = \frac{d_i}{d_o} = \frac{h_i}{h_o} \quad m = \frac{f}{s_o} = \frac{s_i}{f} \quad \text{rānei}$$

$$n_1 \sin \theta_1 = n_2 \sin \theta_2 \quad \frac{n_1}{n_2} = \frac{v_2}{v_1} = \frac{\lambda_2}{\lambda_1}$$

$$v = f\lambda \quad f = \frac{1}{T} \quad v = \frac{d}{t}$$

Te tere o te aho i rō korehau = $3.00 \times 10^8 \text{ m s}^{-1}$

91171M Te whakaatu māramatanga ki te pūnaha pūkahakaha

$$v = \frac{\Delta d}{\Delta t} \quad a = \frac{\Delta v}{\Delta t} \quad v_f = v_i + at$$

$$d = v_i t + \frac{1}{2} at^2 \quad d = \frac{v_i + v_f}{2} t \quad v_f^2 = v_i^2 + 2ad$$

$$a_c = \frac{v^2}{r}$$

$$F = ma \quad \tau = Fd \quad F = -kx$$

$$F_c = \frac{mv^2}{r} \quad p = mv \quad \Delta p = F \Delta t$$

$$E_p = \frac{1}{2} kx^2 \quad E_k = \frac{1}{2} mv^2 \quad \Delta E_p = mg \Delta h$$

$$W = Fd \quad P = \frac{W}{t}$$

paenga porowhita = $2\pi r$

ina hiahiatia, whakamahia $g = 9.8 \text{ m s}^{-2}$

91173M Te whakaatu māramatanga ki te hiko me te autō ā-hiko

$$E = \frac{V}{d} \quad F = Eq \quad \Delta E_p = Eqd$$

$$E_k = \frac{1}{2} mv^2$$

$$I = \frac{q}{t} \quad V = \frac{\Delta E}{q} \quad V = IR$$

$$P = IV \quad P = \frac{\Delta E}{t}$$

$$R_T = R_1 + R_2 + \dots \quad \frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$$

$$F = BIL \quad F = Bqv \quad V = BvL$$

You may find the following formulae useful.

91170 Demonstrate understanding of waves

$$\frac{1}{f} = \frac{1}{d_o} + \frac{1}{d_i} \quad \text{or} \quad s_i s_o = f^2$$

$$m = \frac{d_i}{d_o} = \frac{h_i}{h_o} \quad \text{or} \quad m = \frac{f}{s_o} = \frac{s_i}{f}$$

$$n_1 \sin \theta_1 = n_2 \sin \theta_2 \quad \frac{n_1}{n_2} = \frac{v_2}{v_1} = \frac{\lambda_2}{\lambda_1}$$

$$v = f\lambda \quad f = \frac{1}{T} \quad v = \frac{d}{t}$$

Speed of light in a vacuum = $3.00 \times 10^8 \text{ m s}^{-1}$

91171 Demonstrate understanding of mechanics

$$v = \frac{\Delta d}{\Delta t} \quad a = \frac{\Delta v}{\Delta t} \quad v_f = v_i + at$$

$$d = v_i t + \frac{1}{2} at^2 \quad d = \frac{v_i + v_f}{2} t \quad v_f^2 = v_i^2 + 2ad$$

$$a_c = \frac{v^2}{r}$$

$$F = ma \quad \tau = Fd \quad F = -kx$$

$$F_c = \frac{mv^2}{r} \quad p = mv \quad \Delta p = F\Delta t$$

$$E_p = \frac{1}{2} kx^2 \quad E_k = \frac{1}{2} mv^2 \quad \Delta E_p = mg\Delta h$$

$$W = Fd \quad P = \frac{W}{t}$$

circumference of circle = $2\pi r$

where needed, use $g = 9.8 \text{ m s}^{-2}$

91173 Demonstrate understanding of electricity and electromagnetism

$$E = \frac{V}{d} \quad F = Eq \quad \Delta E_p = Eqd$$

$$E_k = \frac{1}{2} mv^2$$

$$I = \frac{q}{t} \quad V = \frac{\Delta E}{q} \quad V = IR$$

$$P = IV \quad P = \frac{\Delta E}{t}$$

$$R_T = R_1 + R_2 + \dots \quad \frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2} + \dots$$

$$F = BIL \quad F = Bqv \quad V = BvL$$

English translation of the wording on the front cover

L2-PHYSMR

Level 2 Physics, 2014

2.00 pm Tuesday 18 November 2014

RESOURCE SHEET for 91170, 91171, and 91173

Refer to this sheet to answer the questions in your Question and Answer Booklets.

Check that this booklet has pages 2–3 in the correct order and that none of these pages is blank.

YOU MAY KEEP THIS SHEET AT THE END OF THE EXAMINATION.