10.a)
$$P = 4.99087 \left(\frac{24.55}{42.5} - 24.55\right)^{1.81}$$

$$2 = 390^k$$
 $\Longrightarrow log_{4502} = log_{390}^k$
 $log_{4502} = k log_{390}^2$

$$k = \frac{\log 4502}{\log 390} = 1.41$$

Question			Generic scheme	Illustrative scheme	Max mark
10.	(a)		• evaluate P for $t = 24.55$	•¹ 929	1

Notes:

1. Accept any answer which rounds 929.0368007... to at least 2 significant figures.

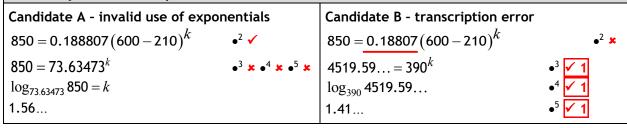
Commonly Observed Responses:

(b)	$ullet^2$ substitute for P and D	• 2 850 = 0.188807 $(600 - 210)^k$	4
	• arrange equation in the form $a = b^k$	$\bullet^3 \frac{850}{0.188807} = (600 - 210)^k$	
	• ⁴ write in logarithmic form	$\bullet^4 \text{ eg } \ln\left(\frac{850}{0.188807}\right) = \ln\left(600 - 210\right)^k$	
		or $k = \log_{(600-210)} \frac{850}{0.188807}$	
	\bullet^5 solve for k	• ⁵ 1.41	

Notes:

- 2. \bullet ³ may be implied by \bullet ⁴.
- 3. Any base may be used at •4 stage.
- 4. Accept 1.4 at •⁵.
- 5. The calculation at •⁵ must follow from the valid use of exponentials and logarithms at •³ and •⁴. See Candidate A.
- 6. For candidates who take an iterative approach to arrive at the value t = 1.41 award 1/4. However, if, in the iterations P is calculated for t = 1.405 and t = 1.415 then award 4/4.

Commonly Observed Responses:



[END OF MARKING INSTRUCTIONS]