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**SEMESTER ONE**

**MATHEMATICS**

**METHODS**

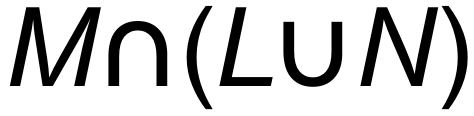
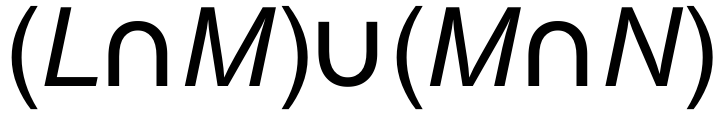
**UNITS 1**

**2017**

**SOLUTIONS**

***Calculator−free Solutions***

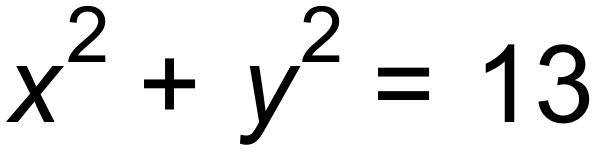
1. (a) (i)  ✓

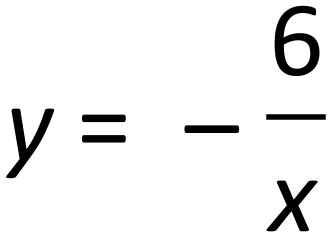
(ii) * or * ✓

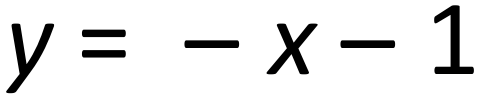
(b)(i)  = {3} ✓

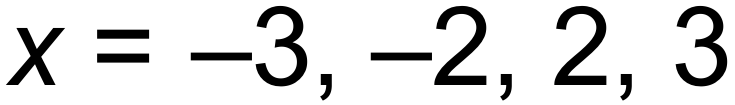
(ii)  = {8, 9, 10, 14, 15, 16, 18, 19} ✓

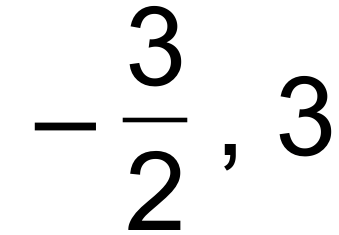
(iii)  = 8 ✓ [5]

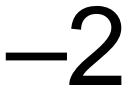
2. (a) (i)  ✓✓

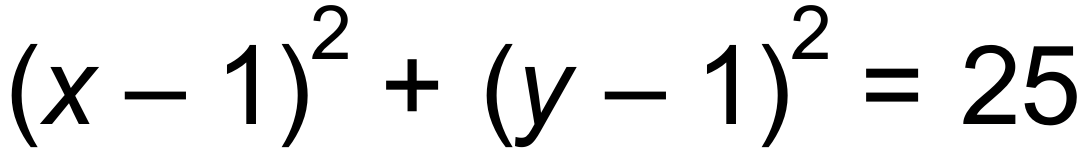
(ii)  ✓✓

(iii)  ✓✓

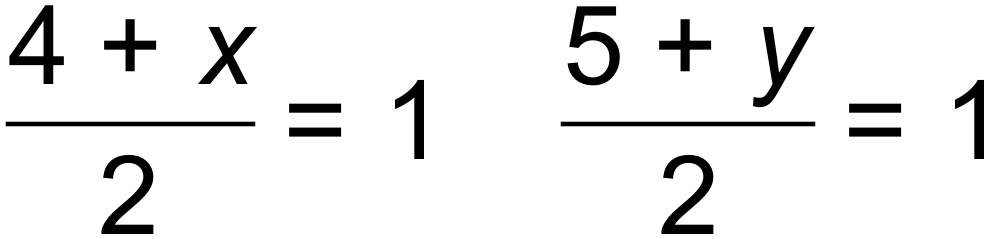
(b)  ✓✓

(c) (i) () ✓✓

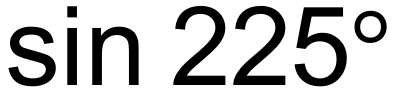
(ii) m =  ✓ [11]

3.  ✓

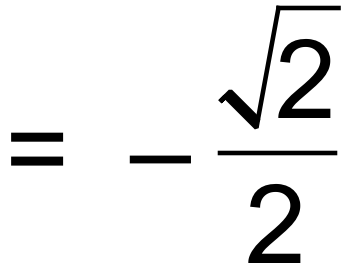
Centre (1, 1)

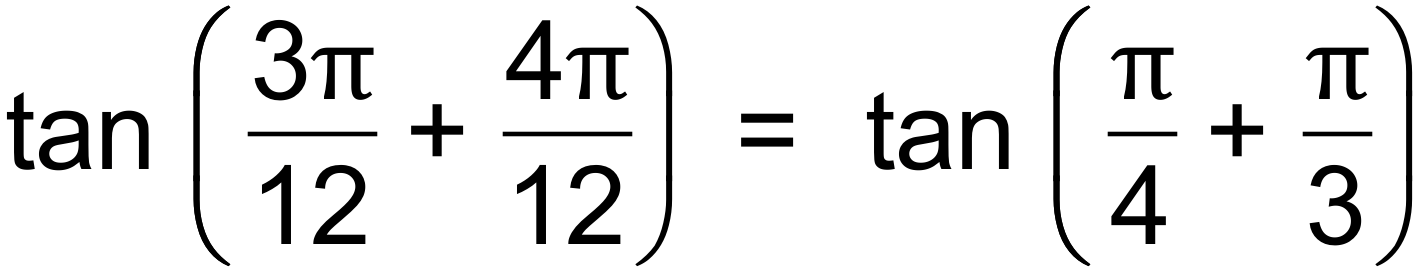
 ✓

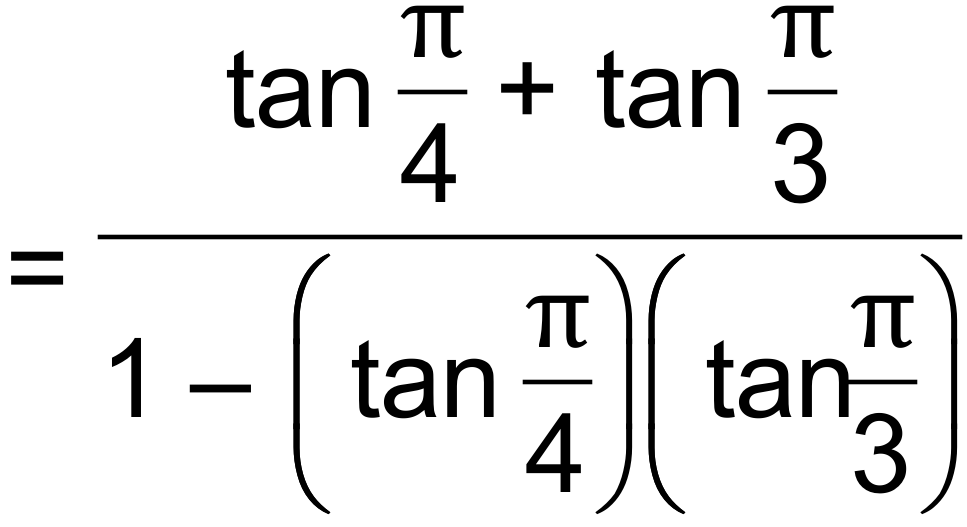
M  ✓✓ [4]

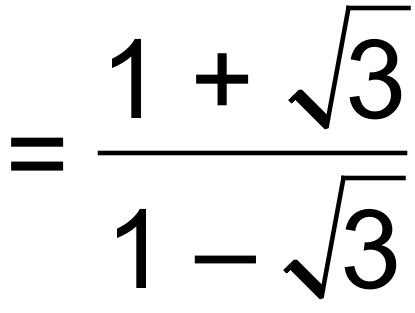
4. (a)  ✓

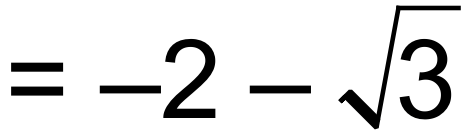


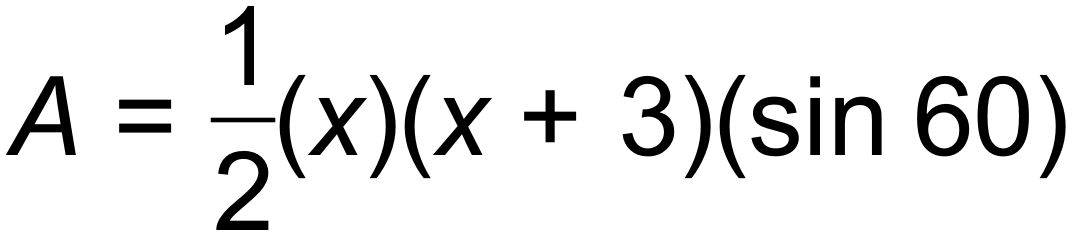
 ✓

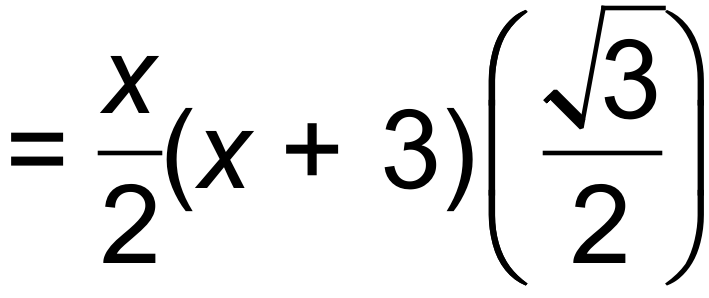
(b)  ✓

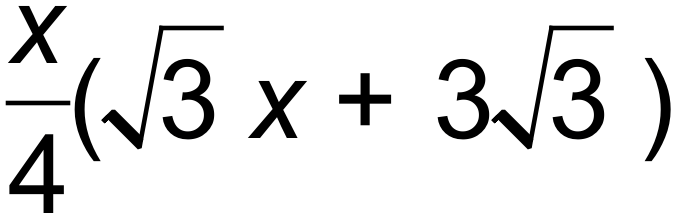
 ✓

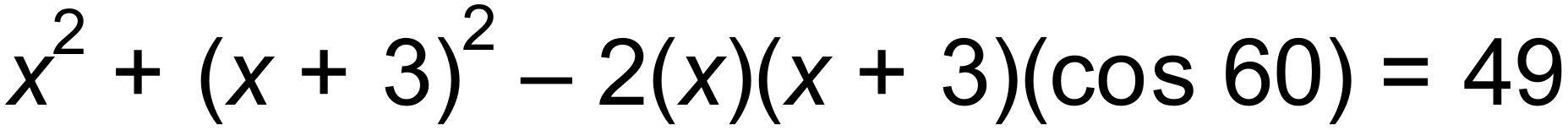
 ✓

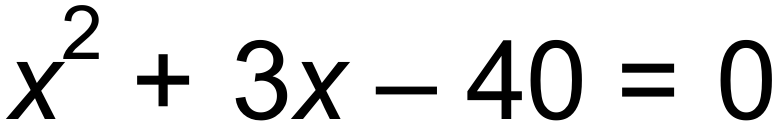
 ✓ [6]

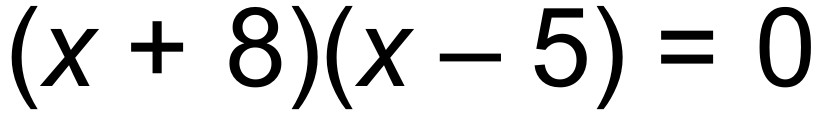
5. (a)  ✓

 ✓

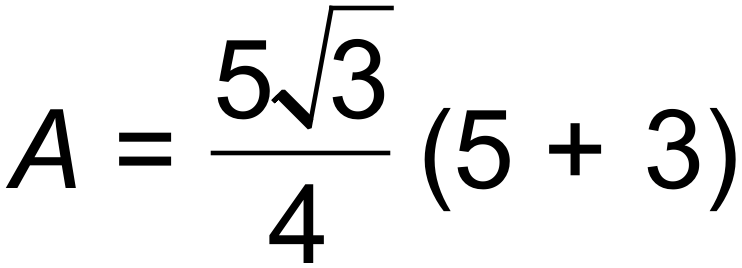
=  cm2

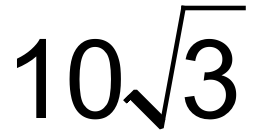
(b)  ✓



 ✓

 ✓

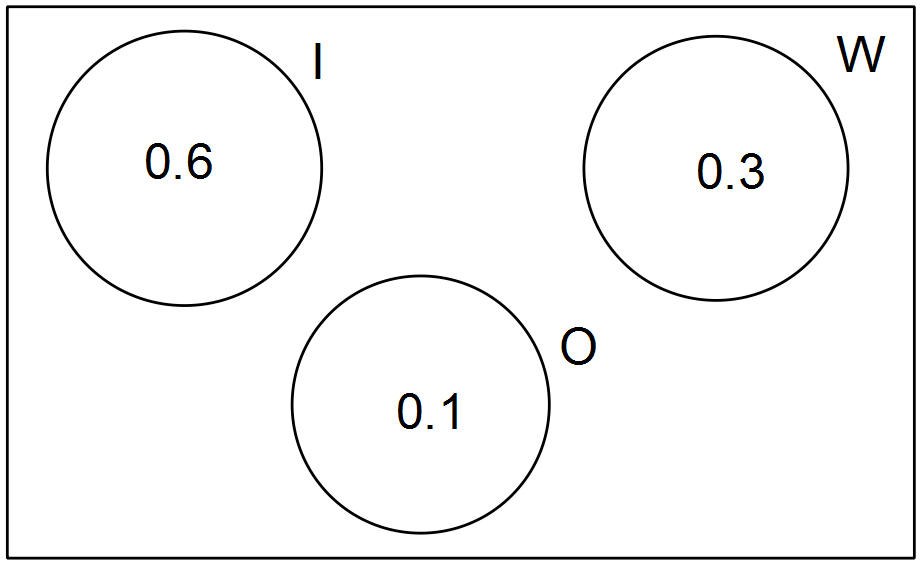
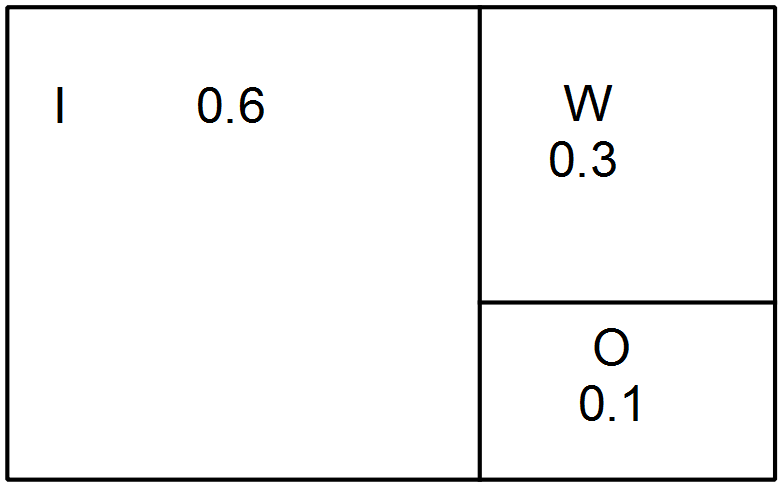
(c)  ✓

 cm2 ✓ [7]

6. (a) 60% ✓

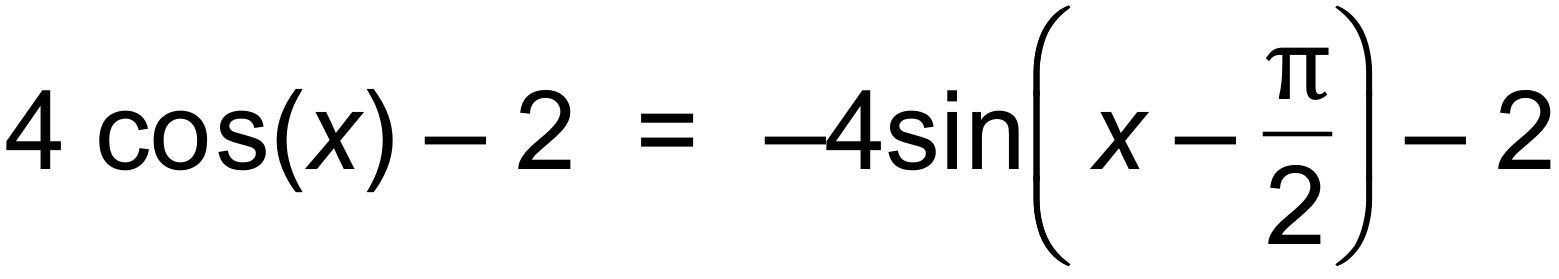
(b) 40% ✓

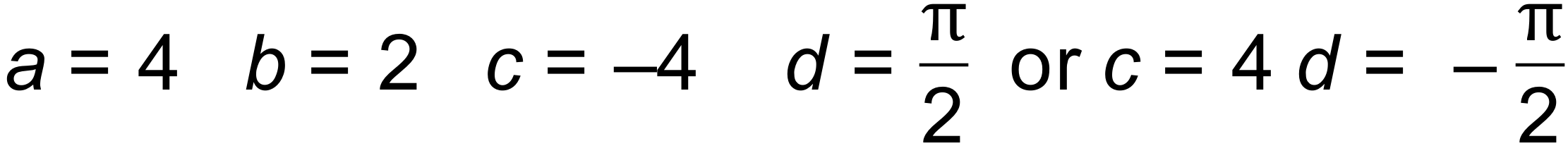
(c) 70% ✓

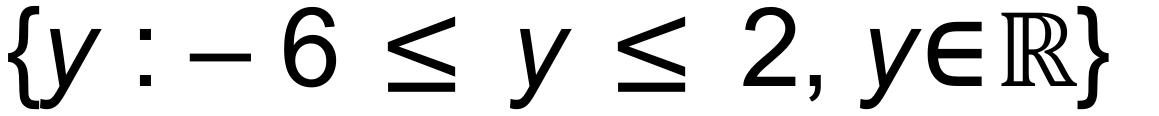
(d)

 Or

✓✓ [5]

7. (a) 

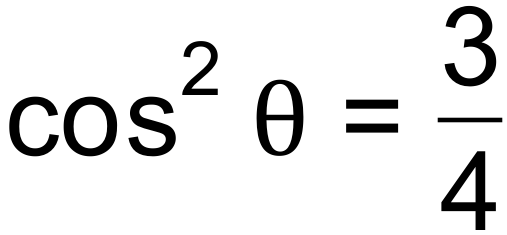
**** ✓✓✓✓

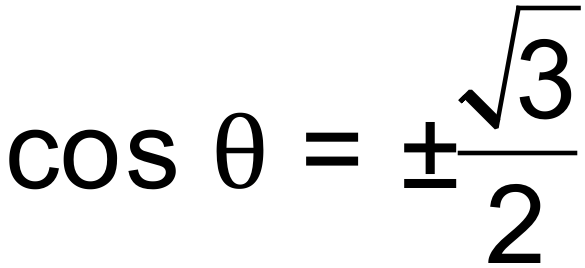
(b) Rk(x)=  ✓✓

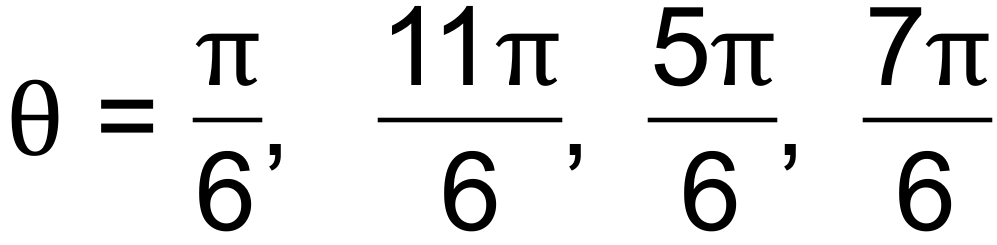
(c) For every *x* value there is only one *y* value✓

Vertical line through graph ✓ [8]

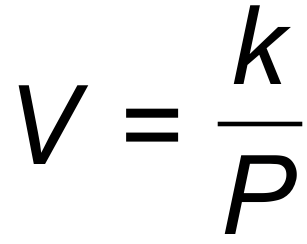
8. (a)  ✓✓

(b) 

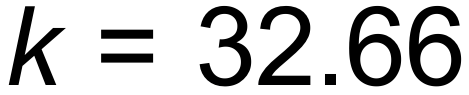
 ✓

 ✓✓ [5]

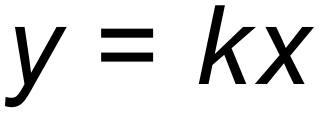
***Calculator−assumed Solutions***

9**.** (a) (i) 

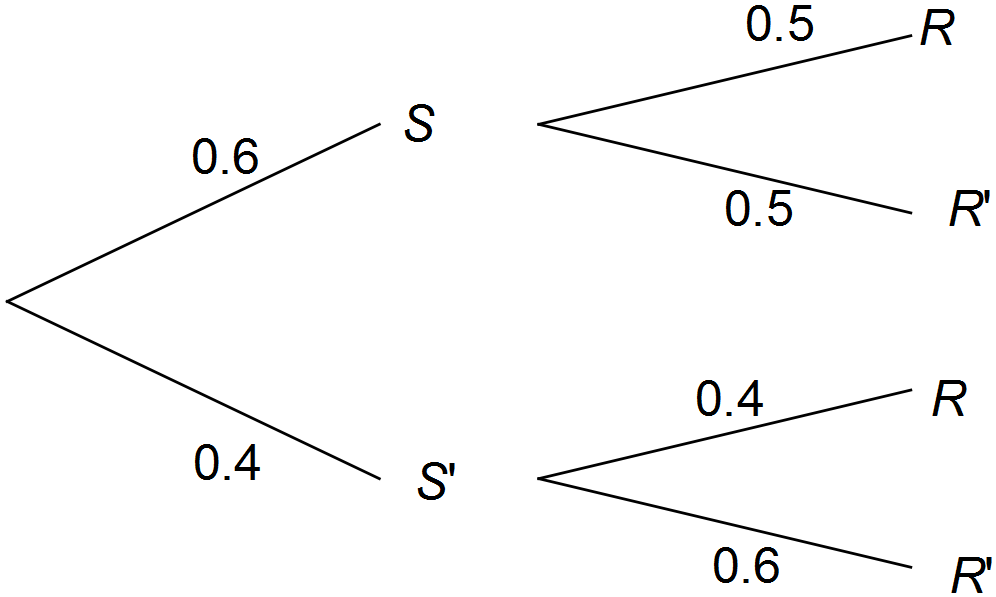
 ✓

 ✓

(ii) The volume doubles. ✓

(b)  is a linear relationship in the form  where

 and is therefore directly proportional. ✓✓ [5]

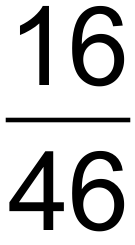
10. (a)

✓✓✓

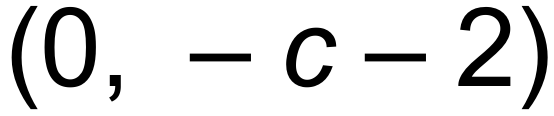
(b) (i) 0.3 ✓

(ii) 0.24 ✓

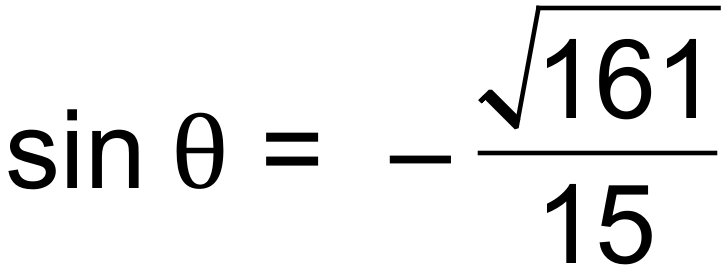
(iii) 0.46 ✓✓

(iv) 0.348 or  ✓✓ [9]

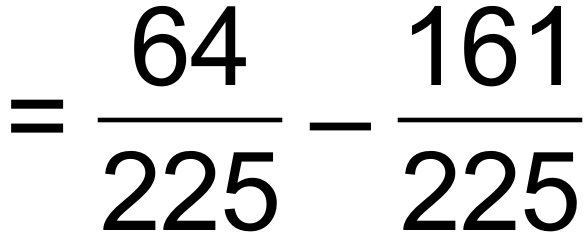
11. (a)  ✓

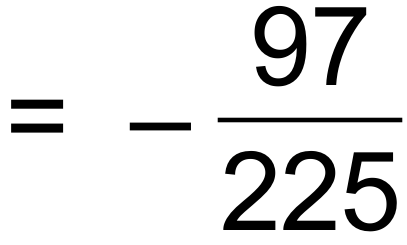
(b)  ✓✓

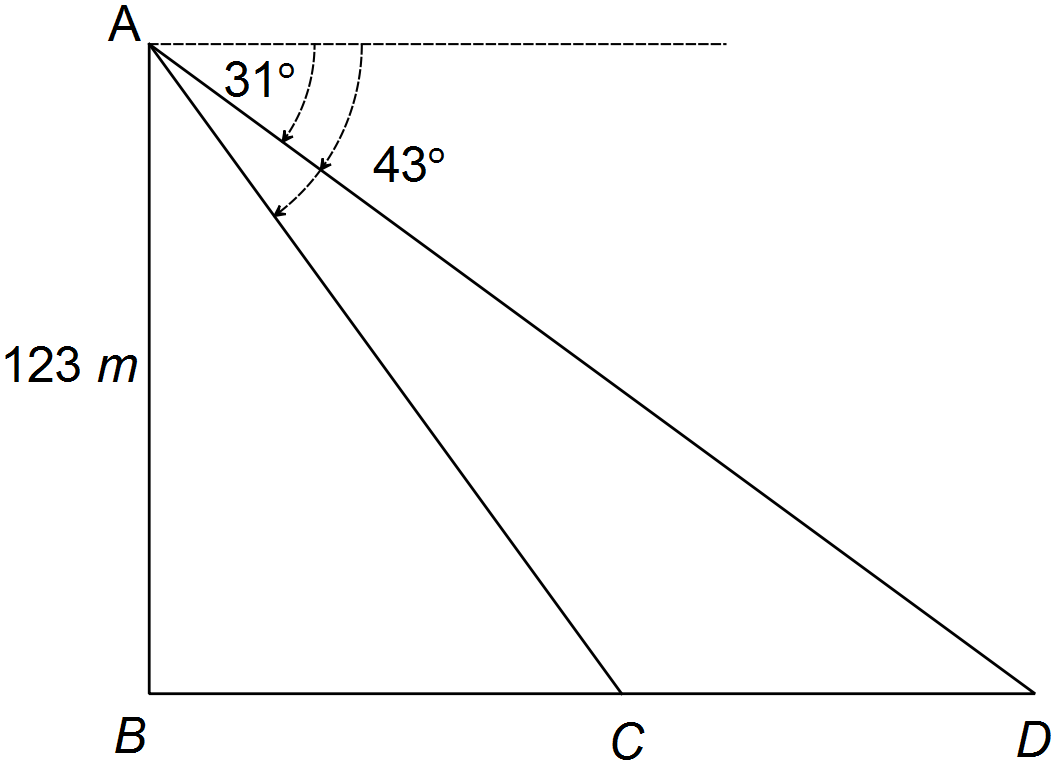
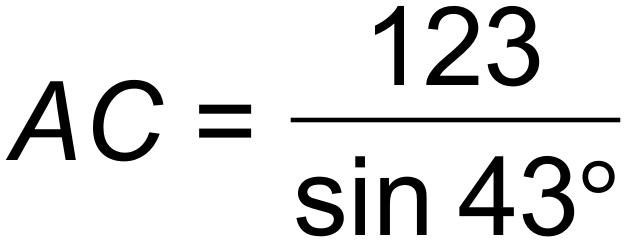
(c) ** ✓✓ [5]

12. (a)  ✓

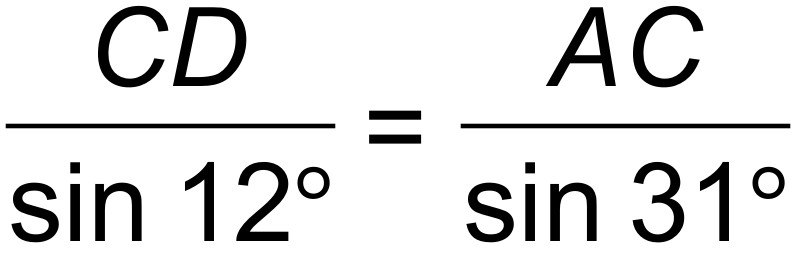
 ✓

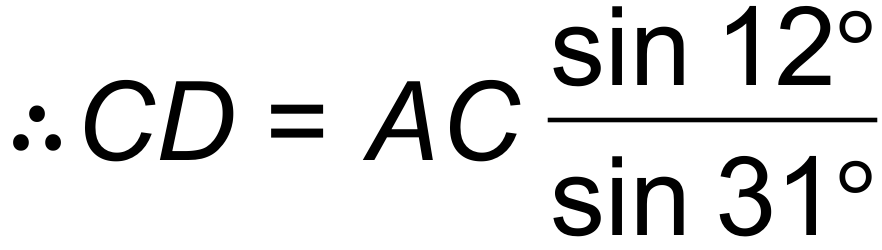
 ✓

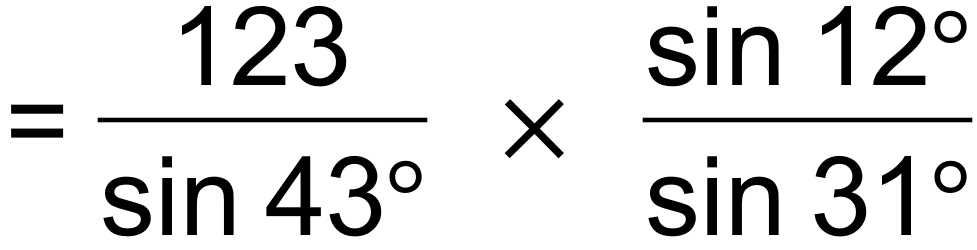
 ✓

(b)  ✓

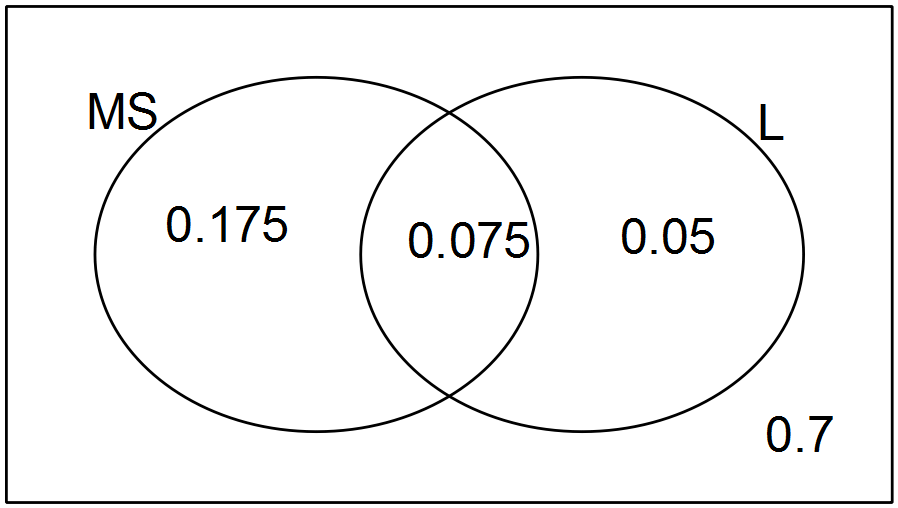
 and  ✓



 ✓



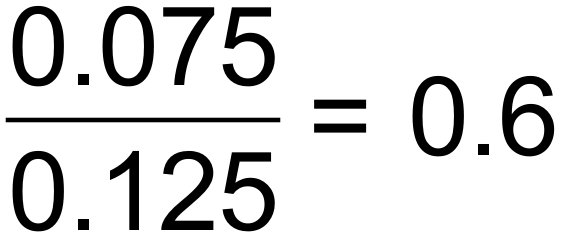
= 73 m ✓ [8]

13. (a)

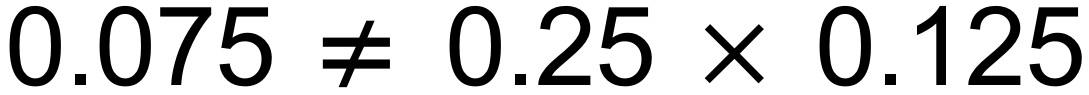
✓✓✓

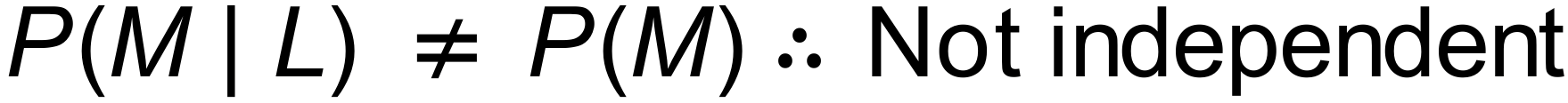
(b) 0.075 ✓

(c) 133 ✓

(d)  ✓✓

(e)  to be independent.

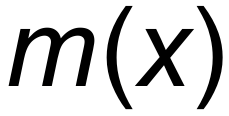
 ✓

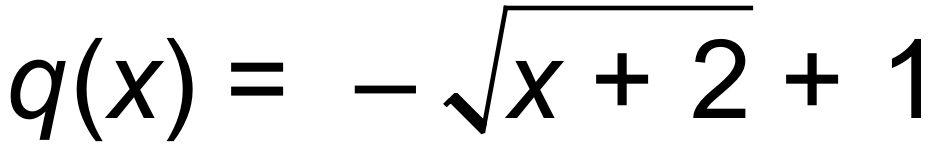
Therefore not independent or  ✓ [9]

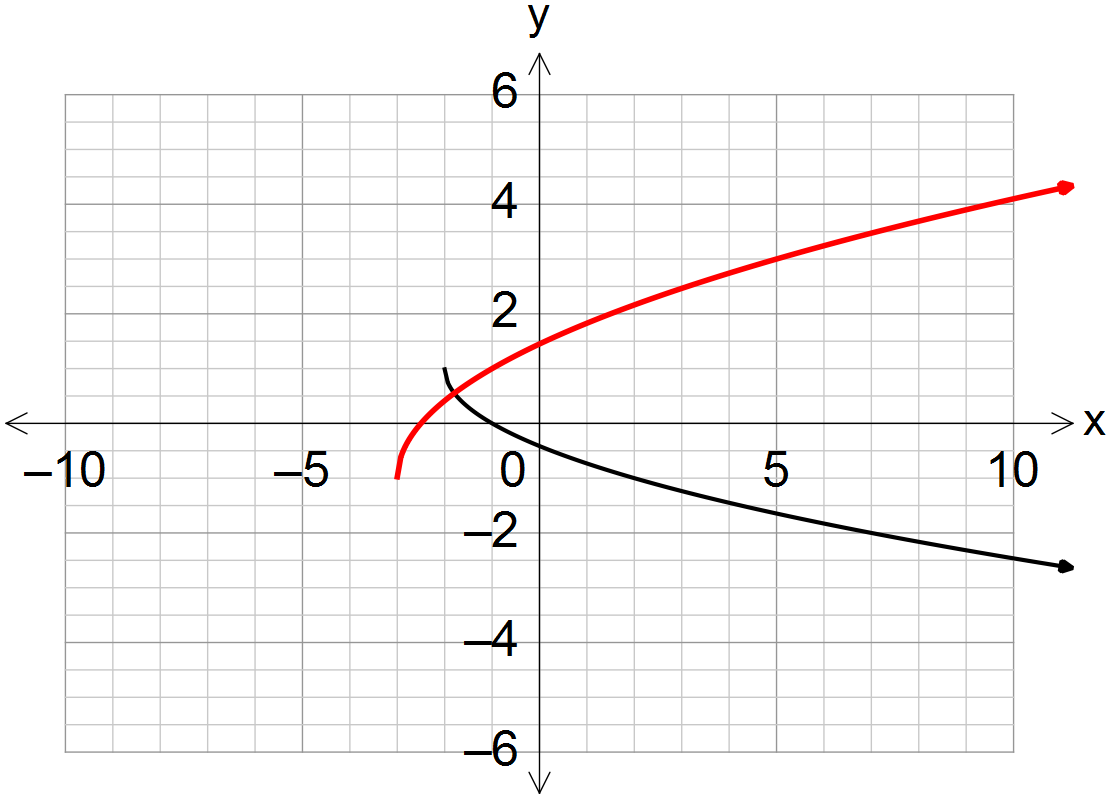
14. (a) (i) 3 ✓

(ii) 0 ✓

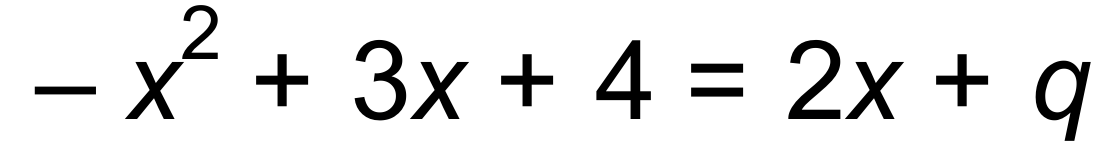
(iii)1 ✓

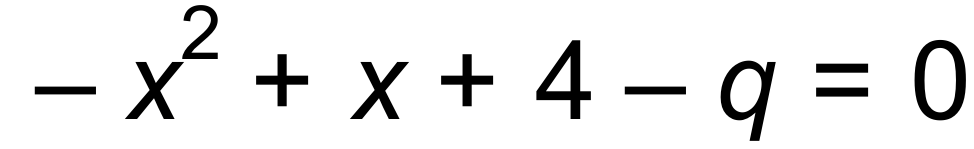
(b) Domain of  is the same as . For both:  ✓✓

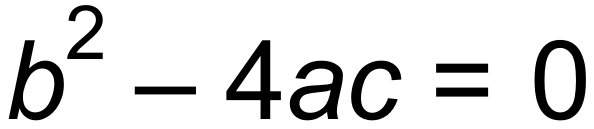
(c)  ✓✓

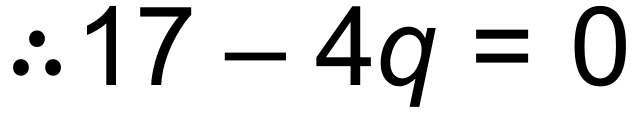
 (d)

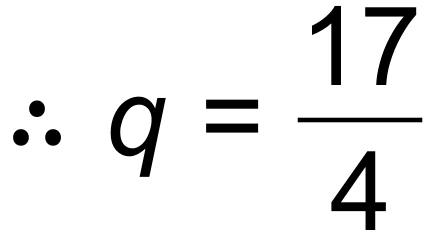
✓✓✓ [10]

15. (a)  ✓

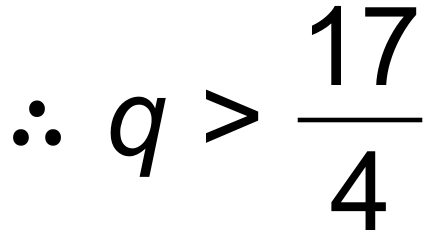
 ✓

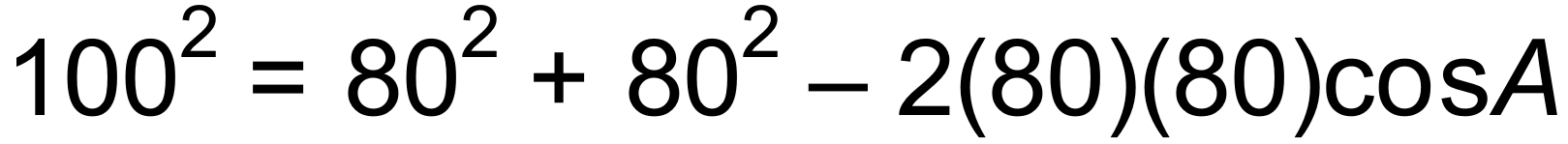
 for one solution

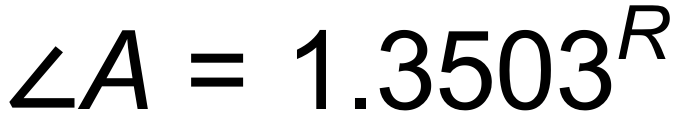
 ✓

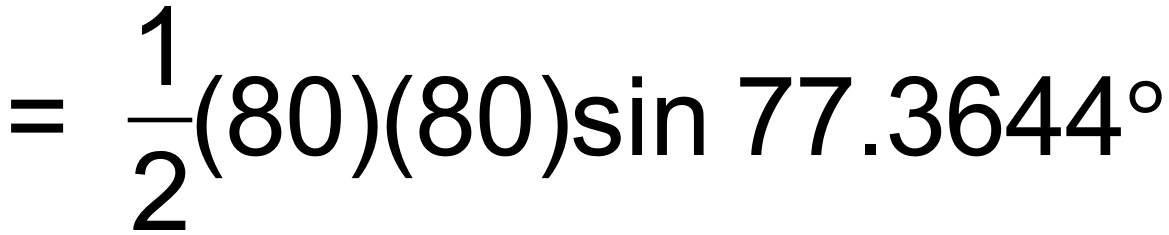
 ✓

(b)  ✓

 ✓ [6]

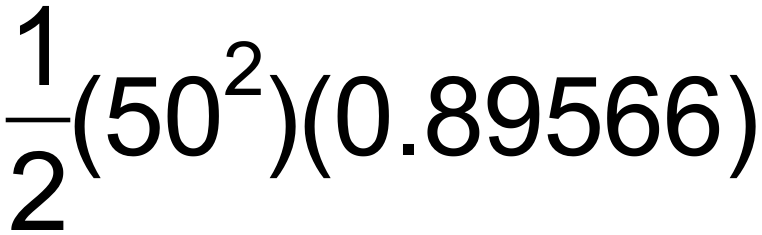
16. (a) 

 or  ✓

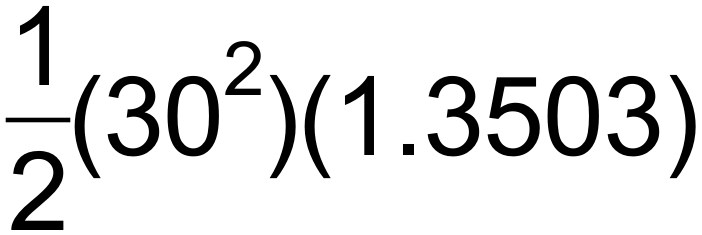
Area  ✓

= 3122.4993 cm2 ✓

(b)  ✓

Area of sector = 

= 1119.56 cm2 ✓

Area of small sector = 

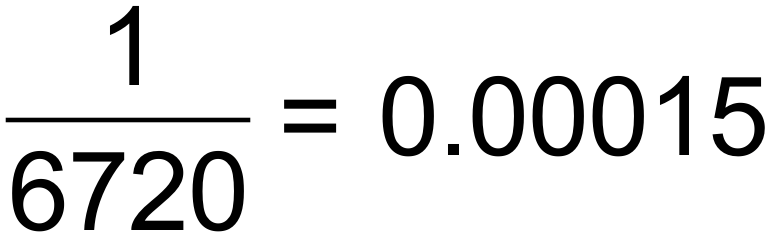
= 607.635 cm2 ✓

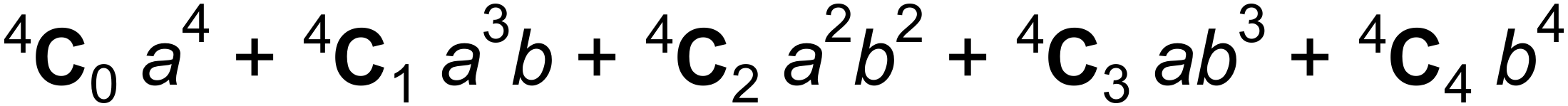
Area of shaded section = 3122.4993 – (2)(1119.58) – (607.635)

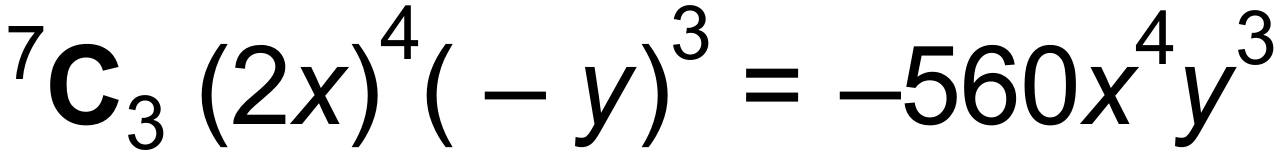
= 275.704

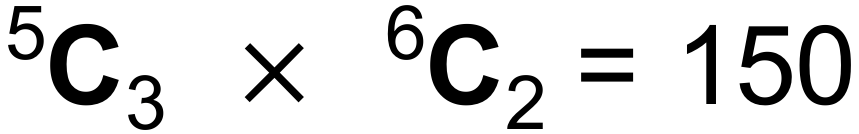
= 276 cm2 ✓ [7]

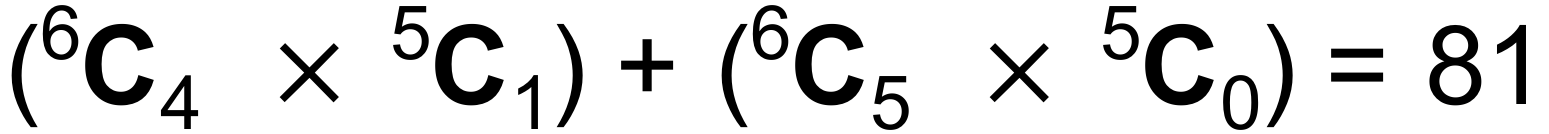
17. (a) (i)  ✓✓

(ii)  ✓

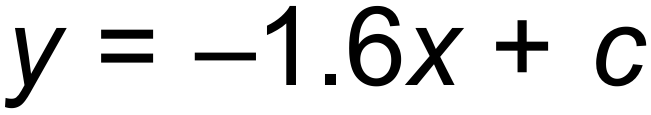
(b) (i)  ✓✓

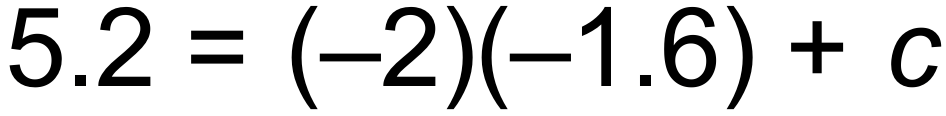
(ii)  ✓✓

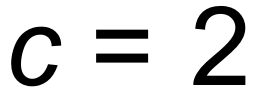
(c) (i)  ✓

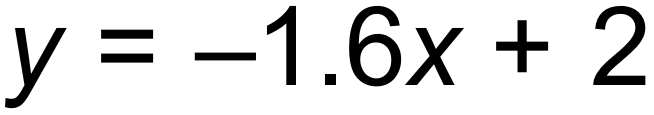
(ii)  ✓✓ [10]

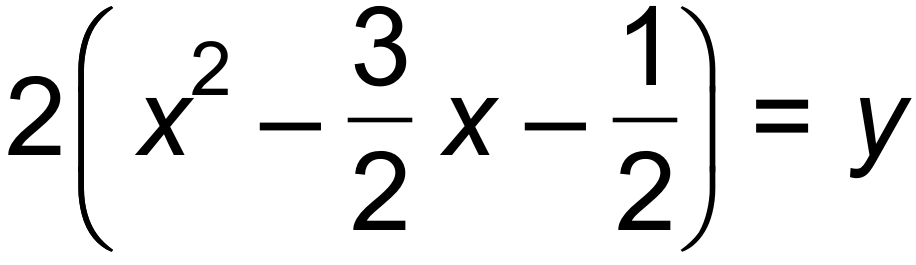
18. (a) 

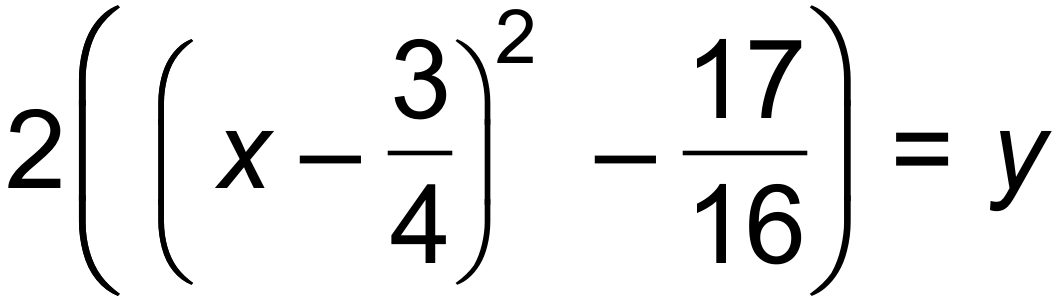
 ✓

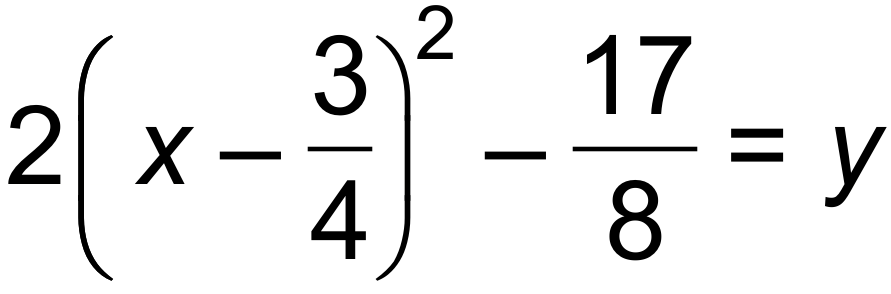


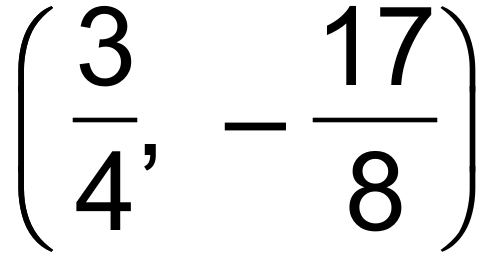


 ✓

(b) 

 ✓

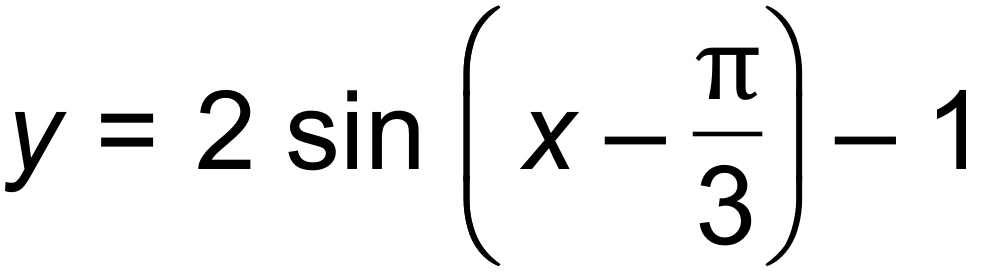
 ✓

Turning Point (  ✓

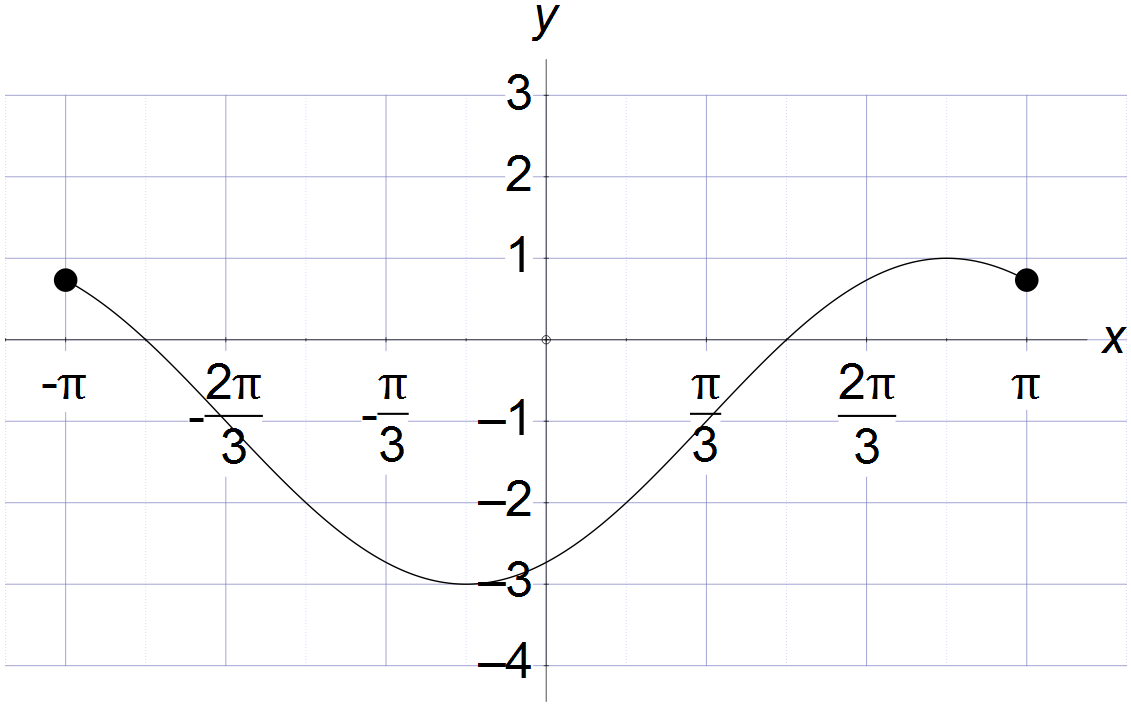
(c) (i) 1 m ✓

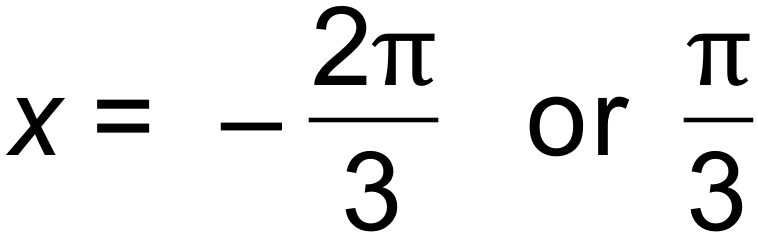
(ii) 5.5m ✓

(iii) 1.77 m or 28.23 m away ✓✓ [9]

19. (a)  ✓✓

(b)

 ✓✓✓

(c) **** ✓ [6]

20. (a)

|  |  |  |  |
| --- | --- | --- | --- |
|  | *H* |  |  |
|  | 0.4 | 0.3 | 0.7 |
|  | 0.2 | 0.1 | 0.3 |
|  | 0.6 | 0.4 | 1 |

✓✓✓

(b) (i) 0.3 ✓

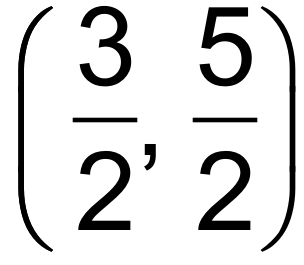
(ii) 0.6 ✓

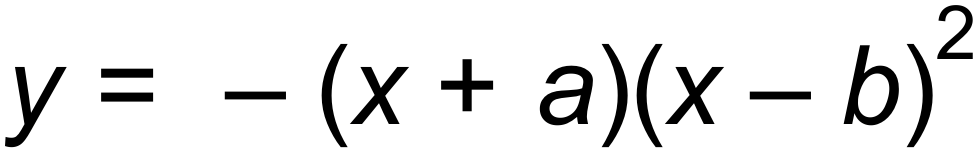
(iii) 0.1 ✓

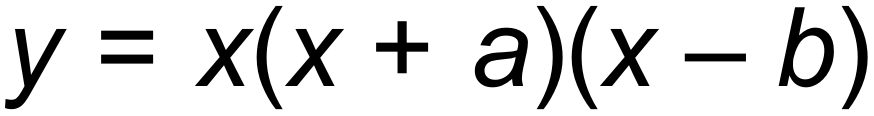
(iv) 0.9 ✓

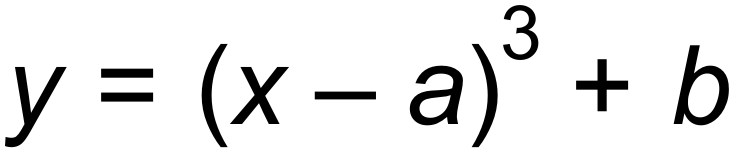
(v)  ✓✓

(c) Not mutually exclusive: *P*(**) = 0.4 Should be 0 ✓[10]

21. (a) *C*   *r* = 3 ✓✓

(b) (i)  ✓

(ii)  ✓

(iii)  ✓ [5]

**End of Questions**