

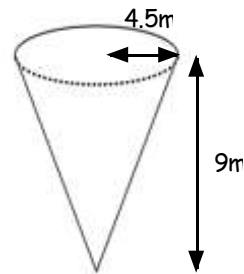
# Intermediate 2 - Unit 1 - Practice NAB 1

## Outcome 1

1. The Dunbartonshire Bank pays 5% compound interest per annum. How much interest would be received after 2 years on a deposit of £480? (4)
2. A new car costs £15000. The value of the car depreciated by 17% after the first year and by 9% after the second year. Calculate the value of the car after 2 years. (4)

## Outcome 2

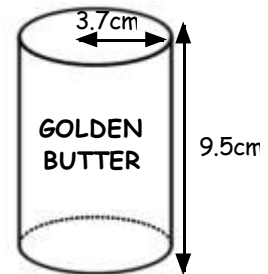
3. A container is in the shape of a cone as shown in the diagram. Calculate the volume of the container. (2)



4. Calculate the volume of a sphere with radius 5.4cm. Give your answer correct to 2 significant figures and state the units clearly. (4)



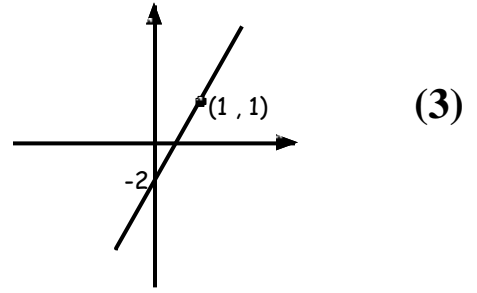
5. A dairy produces a pack of butter in the shape of a cylinder. The radius of the base is 3.7cm and the height is 9.5cm. Calculate the volume of the cylinder. Give your answer correct to 3 significant figures. (3)



## Outcome 3

6. A is the point  $(-1,-2)$  and B is the point  $(5,2)$ . Find the gradient of the line AB. (2)
7. A line has equation  $y = 4x - 1$ . Make a sketch of this line on blank paper showing the coordinates of the intercept on the y axis. (2)

8. Find the equation of the straight line in the diagram opposite in terms of  $x$  and  $y$ .

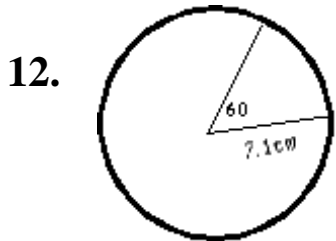
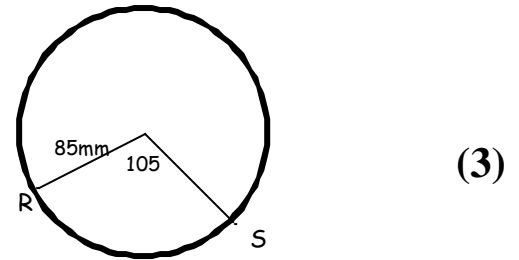


**Outcome 4**

9. Simplify: **a)**  $x(4x-y)$                       **(b)**  $(x+3)(x+1)$                       **(3)**
10. Factorise: **a)**  $y^2 - 3y$                       **(b)**  $p^2 - q^2$                       **(c)**  $x^2 - x - 12$                       **(4)**

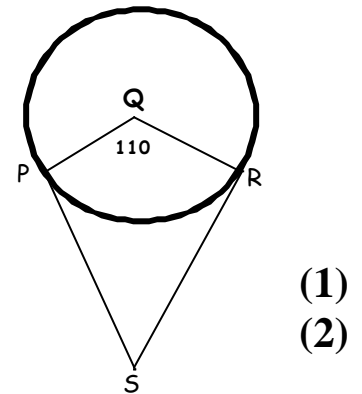
**Outcome 5**

11. Calculate the length of the minor arc RS in this circle with radius of 85mm.

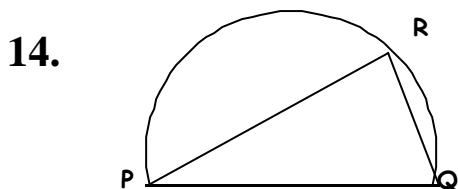


12. Calculate the area of the major sector of the circle with radius 7.1cm shown. **(3)**

13. The diagram below shows a kite PQRS and a circle with centre Q. PS is the tangent to the circle at P and RS is the tangent to the circle at R. Given that angle PQR is 110.



- a)** state the size of angle QRS **(1)**  
**b)** find the size of angle PSR **(2)**



14. The diagram shows a triangle PQR inscribed in a Semicircle with diameter PQ. Given that the angle RPQ is 50, find the size of the shaded angle. **(1)**

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## Solutions

### Outcome 1 - You need 5 out of 8 to pass.

1. Total =  $1.05^2 \times 480$   
= £529.20

Interest =  $529.20 - 480$   
= £49.20

2. Year 1 =  $0.83 \times 15000$   
= £12450

Year 2 =  $0.91 \times 12450$   
= £11329.50

### Outcome 2 - You need 6 out of 9 to pass.

3.  $V = \frac{1}{3}\pi r^2 h$   
=  $\frac{1}{3} \times \pi \times 4.5^2 \times 9$   
=  $572.555.. \div 3$   
=  $190.85\text{m}^3$

4.  $V = \frac{4}{3}\pi r^3$   
=  $4 \times \pi \times 5.4^3 \div 3$   
=  $1978.75.. \div 3$   
= 659.58  
=  $660\text{cm}^3$

5.  $V = \pi r^2 h$   
=  $\pi \times 3.7^2 \times 9.5$   
= 408.58  
=  $409\text{cm}^3$

### Outcome 3 - You need 5 out of 7 to pass.

6.  $m = \frac{y_2 - y_1}{x_2 - x_1}$   
=  $\frac{2 - (-2)}{5 - (-1)}$   
=  $\frac{4}{6}$   
=  $\frac{2}{3}$

7. Diagram drawn with straight line passing the point (0, -1) and rising steeply from Left to Right.

8.  $m = \frac{y_2 - y_1}{x_2 - x_1}$   
=  $\frac{-2 - 1}{0 - 1}$   
=  $\frac{-3}{-1}$   
= 3

Equation is  $y = 3x - 2$

**Outcome 4 - You need 5 out of 7 to pass.**

9. a)  $x(4x-y) = 4x^2 - xy$  (b)  $(x+3)(x+1) = x^2 + 4x + 3$

10. a)  $y^2 - 3y = y(y - 3)$  (b)  $p^2 - q^2 = (p - q)(p + q)$

c)  $x^2 - x - 12 = (x + 3)(x - 4)$

**Outcome 5 - You need 7 out of 10 to pass.**

11. Arc =  $\frac{x}{360} \times \pi D$   
=  $\frac{105}{360} \times \pi \times 170$   
=  $\frac{56077.429}{360}$   
= 155.77mm

12. Area =  $\frac{x}{360} \times \pi r^2$   
=  $\frac{300}{360} \times \pi \times 7.1^2$   
=  $\frac{47510.3057}{360}$   
= 131.97cm<sup>2</sup>

13. a) Angle QRS = 90

(b) PSR =  $360 - (110 + 90 + 90)$   
= 70

14. PSR =  $180 - (90 + 50)$   
= 40