

Intermediate 2 - Unit 2 - Practice NAB 1

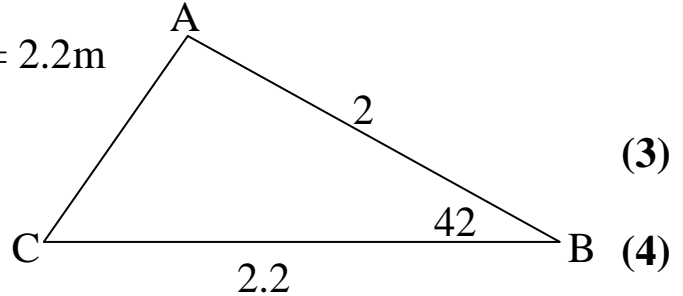
Outcome 1

1. An advertising sign is in the shape of a triangle as shown.

Angle ABC = 42, AB = 2m and BC = 2.2m

- a) Calculate the area of the sign

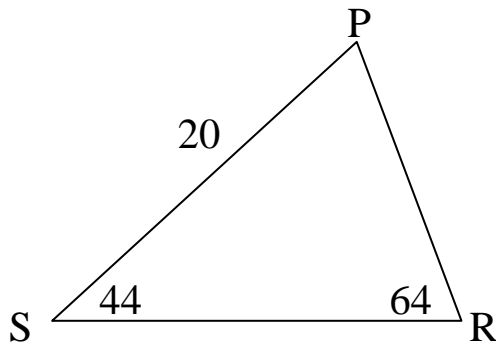
- b) Calculate the length of AC



(3)

(4)

- 2.



The course for a race is shown.

Angles PSR = 44, PRS = 64 & SP = 20m

Calculate the size of PR.

(3)

Outcome 2

3. a) On the same diagram, draw the lines: $2x - y = 8$ and $x + y = 4$ (2)

- b) Use the graph to solve the system of equations: $2x - y = 8$
 $x + y = 4$ (1)

4. Solve, algebraically, the system of equations: $3x - 4y = 5$
(Do NOT draw the graphs!!!) $2x + 2y = 8$ (3)

Outcome 3

5. A survey on the number of pupils in each subject class in third year is shown below:

30 24 12 26 28 15 19 22 26 14

- a) Find the maximum, minimum, median and quartiles of this data. (4)

- b) Draw a boxplot to illustrate the data. (2)

6. A group of 60 members of a fitness club were asked which machine they used most. The table below shows the results:

<u>Machine</u>	<u>Frequency</u>	<u>Angle in pie chart</u>
Rowing	19	
Bicycle	15	
Treadmill	26	

- a) Copy and complete this table. (2)
- b) Draw a pie chart to illustrate the data. (2)

Outcome 4

7. The temperature in ten places in Glasgow on March 15th are shown below:

13 11 16 15 12 13 14 12 16 15

Find the mean and the standard deviation of this random sample, showing all necessary working. (4)

8. A restaurant finds that the cost of running his restaurant depends on the number of meals served.

<u>Number of meals</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>50</u>
Cost in £	180	188	202	230	220

- a) Plot the points and draw the best fitting straight line through them. (1)
- b) Find the equation of the line. (3)
- c) Use your equation to estimate the cost when 25 meals are served. (2)
9. A game of bingo is played using balls numbered 1 to 99.
What is the probability that a ball chosen at random is greater than 90? (2)

Intermediate 2 - Unit 2 - Practice NAB 1 Solutions

Outcome 1 - You need 7 out of 10 to pass

1. a) $A = \frac{1}{2}ab\sin C$
 $= \frac{1}{2} \times 2 \times 2.2 \times \sin 42$
 $= 1.47\text{m}^2$

(b) $a^2 = b^2 + c^2 - 2bc\cos A$
 $a^2 = 2^2 + 2.2^2 - 2 \times 2 \times 2.2 \times \cos 42$
 $a^2 = 8.84 - 6.54$
 $a^2 = 2.3$
 $a = \sqrt{2.3}$
 $a = 1.52\text{m}$

2. $\frac{p}{\sin P} = \frac{r}{\sin R} = \frac{s}{\sin S}$
 $\frac{20}{\sin 64} = \frac{PR}{\sin 44}$
 $PR = \frac{20 \times \sin 44}{\sin 64}$
 $PR = 15.46$

Outcome 2 - You need 4 out of 6 to pass

3. a) Draw the two lines on the same diagram.

b) (4, 0).

4. $3x - 4y = 5 \rightarrow a$
 $2x + 2y = 8 \rightarrow b$
 $3x - 4y = 5 \rightarrow a$
 $b \times 2 \quad 4x + 4y = 16 \rightarrow c$
 $a + c \quad 7x = 21$
 $x = 3$

sub $x = 3$ into $2x + 2y = 8$
 $2(3) + 2y = 8$
 $6 + 2y = 8$
 $2y = 2$
 $y = 1$

Outcome 3 - You need 7 out of 10 to pass

5. a) 12 14 15 19 22 24 26 26 28 30
L – 12 Q1 - 15 Q2 - 23 Q3 - 26 H - 30
- b) Boxplot drawn.
6. a) Angles: 114, 90, 156
- b) Piechart drawn and labeled.

Outcome 4 - You need 8 out of 12 to pass

7. mean = $\frac{137}{10}$ Use table to get $\Sigma(x - \bar{x})^2 = 28.1$
= 13.7
- $$S = \sqrt{\frac{28.1}{9}} = \sqrt{3.122...} = 1.77$$
8. a) Points plotted with meals along the bottom and cost up the side.
The line of best fit drawn.
- b) You could choose (10 , 180) & (30, 202) and find the gradient: $m = 1.1$
Read y – intercept from graph, should be between 165 and 170
Equation is $C = 1.1x + 167$, your answer may be slightly different!
- c) Cost = $1.1 \times 25 + 167$
= $27.5 + 167$
= £194.50 your answer may be slightly different!
9. $P(>90) = \frac{9}{99}$
= $\frac{1}{11}$

Intermediate 2 - Unit 2 - Practice NAB 2

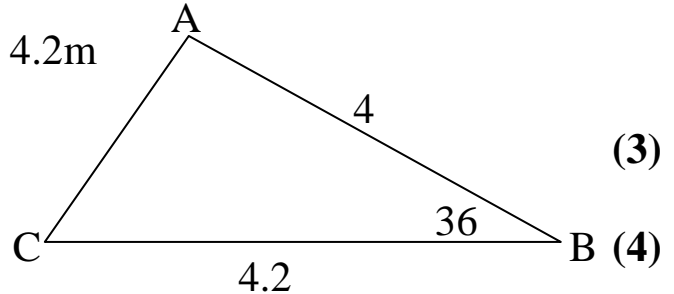
Outcome 1

1. An advertising sign is in the shape of a triangle as shown.

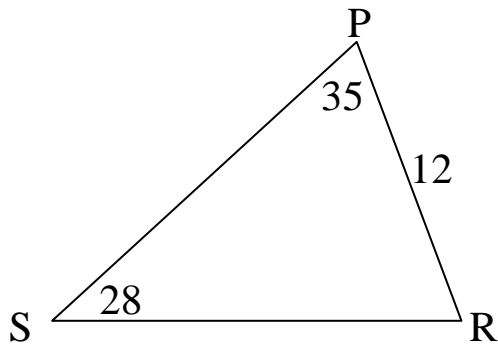
Angle ABC = 36, AB = 4m and BC = 4.2m

- a) Calculate the area of the sign

- b) Calculate the length of AC



- 2.



The course for a race is shown.

Angles SPR = 35, PSR = 28 & PR = 12

Calculate the length of RS

(3)

Outcome 2

3. a) On the same diagram, draw the lines: $x + 2y = 8$ and $x - y = -1$ (2)

- b) Use the graph to solve the system of equations: $x + 2y = 8$
 $x - y = -1$ (1)

4. Solve, algebraically, the system of equations: $5x - 2y = 21$
(Do NOT draw the graphs!!!) $2x - 3y = 4$ (3)

Outcome 3

5. A survey on the number of pupils in each subject class in third year is shown below:

18 16 24 26 28 14 21 22 28 16

- a) Find the maximum, minimum, median and quartiles of this data. (4)
b) Draw a boxplot to illustrate the data. (2)

6. A group of 45 members of a fitness club were asked which machine they used most. The table below shows the results:

<u>Machine</u>	<u>Frequency</u>	<u>Angle in pie chart</u>
Rowing	9	
Bicycle	25	
Treadmill	11	

- a) Copy and complete this table. (2)
- b) Draw a pie chart to illustrate the data. (2)

Outcome 4

7. The temperature in 7 places in Glasgow on March 15th are shown below:

7 9 12 6 5 13 8

Find the mean and the standard deviation of this random sample, showing all necessary working. (4)

8. A restaurant finds that the cost of running his restaurant depends on the number of meals served.

<u>Number of meals</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>50</u>
Cost in £	150	158	172	200	190

- a) Plot the points and draw the best fitting straight line through them. (1)
- b) Find the equation of the line. (3)
- c) Use your equation to estimate the cost when 25 meals are served. (2)
9. A game of bingo is played using balls numbered 1 to 99.
What is the probability that a ball chosen at random is less than 20? (2)

Intermediate 2 - Unit 2 - Practice NAB 2 Solutions

Outcome 1 - You need 7 out of 10 to pass

1. a) $A = \frac{1}{2}absinC$
 $= \frac{1}{2} \times 4 \times 4.2 \times \sin 36$
 $= 4.94 \text{ m}^2$

(b) $a^2 = b^2 + c^2 - 2bccosA$
 $a^2 = 4^2 + 4.2^2 - 2 \times 4 \times 4.2 \times \cos 36$
 $a^2 = 33.64 - 27.18$
 $a^2 = 6.46$
 $a = \sqrt{6.46}$
 $a = 2.54\text{m}$

2. $\frac{p}{\sin P} = \frac{r}{\sin R} = \frac{s}{\sin S}$
 $\frac{12}{\sin 28} = \frac{SR}{\sin 35}$
 $SR = \frac{12 \times \sin 35}{\sin 28}$
 $SR = 14.66$

Outcome 2 - You need 4 out of 6 to pass

3. a) Draw the two lines on the same diagram.

b) (2, 3).

4. $5x - 2y = 21 \rightarrow a$
 $2x - 3y = 4 \rightarrow b$
 $a \times 3 \quad 15x - 6y = 63 \rightarrow c$
 $b \times 2 \quad 4x - 6y = 8 \rightarrow d$
 $a - d \quad 11x = 55$
 $x = 5$

sub $x = 5$ into $2x - 3y = 4$
 $2(5) - 3y = 4$
 $10 - 3y = 4$
 $-3y = -6$
 $y = 2$

Outcome 3 - You need 7 out of 10 to pass

5. a) 14 16 16 18 21 22 24 26 28 28
L - 14 Q1 - 16 Q2 - 21.5 Q3 - 26 H - 28

b) Boxplot drawn.

6. a) Angles: 72, 200, 88

b) Piechart drawn and labeled.

Outcome 4 - You need 8 out of 12 to pass

7. mean = $\frac{60}{7}$ Use table to get $\Sigma(x - \bar{x})^2 = 53.71$
= 8.57

$$S = \sqrt{\frac{53.71}{6}} = \sqrt{8.952...} = 2.99$$

8. a) Points plotted with meals along the bottom and cost up the side.
The line of best fit drawn.

b) You could choose (10, 150) & (30, 172) and find the gradient: $m = 1.1$
Read y - intercept from graph, should be between 135 and 140
Equation is $C = 1.1x + 137$, your answer may be slightly different!

c) Cost = $1.1 \times 25 + 137$
= $27.5 + 137$
= £164.50 your answer may be slightly different!

9. $P(<20) = \frac{19}{99}$

Intermediate 2 - Unit 2 - Practice NAB 3

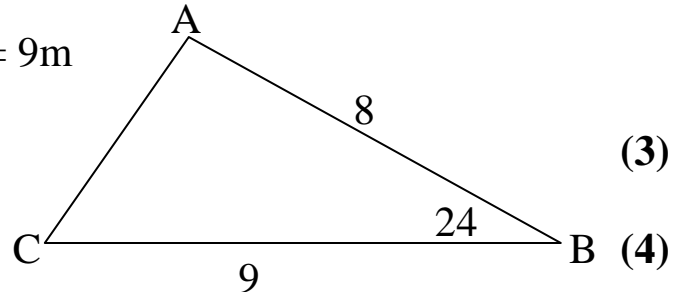
Outcome 1

1. An advertising sign is in the shape of a triangle as shown.

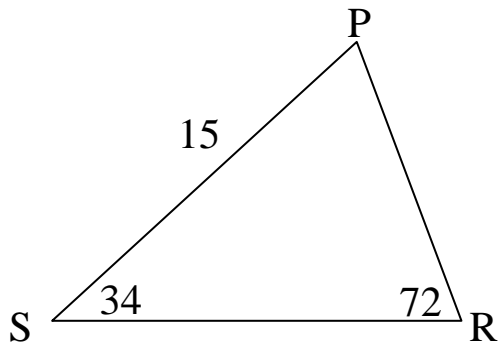
Angle ABC = 24° , AB = 8m and BC = 9m

- a) Calculate the area of the sign

- b) Calculate the length of AC



- 2.



The course for a race is shown.

Angles PRS = 72° , PSR = 34° & SP = 15m

Calculate the size of PR

Outcome 2

3. a) On the same diagram, draw the lines: $x - 2y = 0$ and $x - y = 1$ (2)

- b) Use the graph to solve the system of equations: $x - 2y = 0$
 $x - y = 1$ (1)

4. Solve, algebraically, the system of equations: $5x + 2y = 10$
(Do NOT draw the graphs!!!) $2x + 2y = 4$ (3)

Outcome 3

5. A survey on the number of pupils in each subject class in third year is shown below:

15 24 21 28 14 22 24 18

- a) Find the maximum, minimum, median and quartiles of this data. (4)

- b) Draw a boxplot to illustrate the data. (2)

6. A group of 45 members of a fitness club were asked which machine they used most. The table below shows the results:

<u>Machine</u>	<u>Frequency</u>	<u>Angle in pie chart</u>
Rowing	29	
Bicycle	45	
Treadmill	16	

- a) Copy and complete this table. (2)
- b) Draw a pie chart to illustrate the data. (2)

Outcome 4

7. The temperature in 8 places in Glasgow on March 15th are shown below:

17 19 12 16 15 13 18 15

Find the mean and the standard deviation of this random sample, showing all necessary working. (4)

8. A restaurant finds that the cost of running his restaurant depends on the number of meals served.

<u>Number of meals</u>	<u>10</u>	<u>20</u>	<u>30</u>	<u>40</u>	<u>50</u>
Cost in £	300	316	344	400	380

- a) Plot the points and draw the best fitting straight line through them. (1)
- b) Find the equation of the line. (3)
- c) Use your equation to estimate the cost when 25 meals are served. (2)
9. A game of bingo is played using balls numbered 1 to 99. What is the probability that a ball chosen at random is greater than or equal to 81? (2)

Intermediate 2 - Unit 2 - Practice NAB 3 Solutions

Outcome 1 - You need 7 out of 10 to pass

1. a) $A = \frac{1}{2}absinC$
 $= \frac{1}{2} \times 8 \times 9 \times \sin 24$
 $= 14.64 \text{ m}^2$

(b) $a^2 = b^2 + c^2 - 2bccosA$
 $a^2 = 8^2 + 9^2 - 2 \times 8 \times 9 \times \cos 24$
 $a^2 = 145 - 131.55$
 $a^2 = 13.45$
 $a = \sqrt{13.45}$
 $a = 3.67\text{m}$

2. $\frac{p}{\sin P} = \frac{r}{\sin R} = \frac{s}{\sin S}$
 $\frac{15}{\sin 72} = \frac{PR}{\sin 34}$
 $PR = \frac{15 \times \sin 34}{\sin 72}$
 $PR = 8.82$

Outcome 2 - You need 4 out of 6 to pass

3. a) Draw the two lines on the same diagram.

b) (2, 1).

4. $5x + 2y = 10 \rightarrow a$
 $2x + 2y = 4 \rightarrow b$
a - b $3x = 6$
 $x = 2$

sub $x = 2$ into $2x + 2y = 4$
 $2(2) + 2y = 4$
 $4 + 2y = 4$
 $2y = 0$
 $y = 0$

Outcome 3 - You need 7 out of 10 to pass

5. a) 14 15 18 21 22 24 24 28
L – 14 Q1 – 16.5 Q2 – 21.5 Q3 – 24 H – 28
- b) Boxplot drawn.
6. a) Angles: 116, 180, 64
- b) Piechart drawn and labeled.

Outcome 4 - You need 8 out of 12 to pass

7. mean = $\frac{125}{8}$ Use table to get $\Sigma(x - \bar{x})^2 = 39.86$
= 15.63
- $$S = \sqrt{\frac{39.86}{7}} = \sqrt{5.69} = 2.39$$
8. a) Points plotted with meals along the bottom and cost up the side.
The line of best fit drawn.
- b) You could choose (10 , 300) & (30, 344) and find the gradient: $m = 2.2$
Read $y -$ intercept from graph, should be between 270 and 280
Equation is $C = 2.2x + 275$, your answer may be slightly different!
- c) Cost = $2.2 \times 25 + 275$
= $55 + 275$
= £330 your answer may be slightly different!
9. $P(\geq 81) = \frac{18}{99}$
= $\frac{2}{11}$