




# COUNTDOWN TO YOUR FINAL MATHS EXAM ...

## PART 5 (2017)

	Marks	Actual	  
Q1. Trigonometry – Finding sides	3		
Q2. Trigonometry – Finding angles	3		
Q3. Solving equations	2		
Q4. Simplify/Factorise/Solve	5		
Q5. Pythagoras' Theorem and trigon	4		
Q6. Trigonometry – length and angle	5		
Q7. Expanding brackets/Solve	2		
Q8. Factorise/solve/rearrange	6		
Q9. Trigonometry (finding length) then area of parallelogram	3		
Q10. Trigonometry (finding length) then area of triangle	4		
Q11. Form and expression/substitute/solve and factorise	6		
Q12. Solve and simplify	3		
Q13. Bearings and trigonometry	7		
Q14. Circle theorems and trigonometry (Higher tier only)	5		

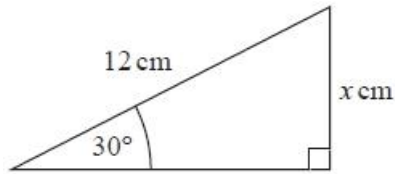
**58**

---

**Q1.** (a) Write down the exact value of  $\cos 30^\circ$

..... (1)

(b)



Given that  $\sin 30^\circ = 0.5$ ,  
work out the value of  $x$ .

..... (2)

(Total for question is 3 marks)

**Q2.**

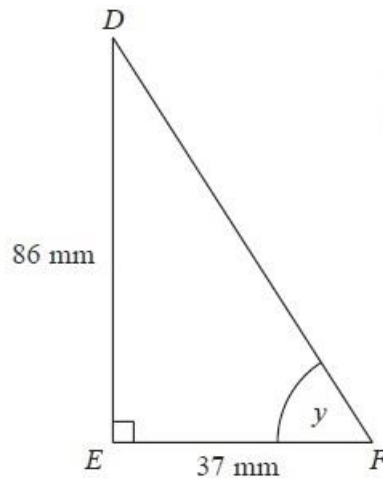


Diagram NOT  
accurately drawn

$DEF$  is a right-angled triangle.

$DE = 86$  mm

$EF = 37$  mm

Calculate the size of the angle marked  $y$ .

Give your answer correct to 1 decimal place.

.....  
(Total for Question is 3 marks)

Q3. (a) Solve  $4x = 20$

(1)

(b) Solve  $y - 9 = 17$

(1)

(Total for question = 2 marks)

Q4. (a) Simplify  $7x + 2y - 3x + 4y$

..... (2)

(b) Factorise  $10x - 15$

..... (1)

(c) Solve  $5p = 3p + 8$

$p =$  ..... (2)

(Total for question = 5 marks)

Q5.

In the diagram,

triangles  $ABD$  and  $BCD$  are right-angled triangles

$AB = 5$  cm

$AD = 10$  cm

$CD = 4$  cm

Angle  $ADB = 30^\circ$

Work out the value of  $x$ .

Give your answer correct to 2 decimal places.

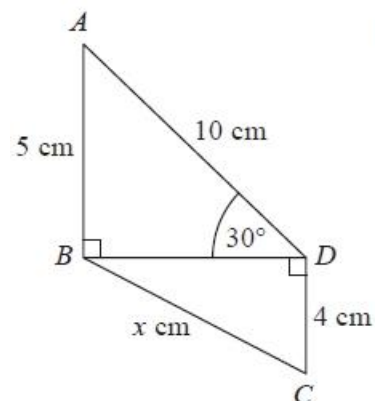


Diagram NOT accurately drawn

.....cm

(Total for question = 4 marks)

**Q6.**

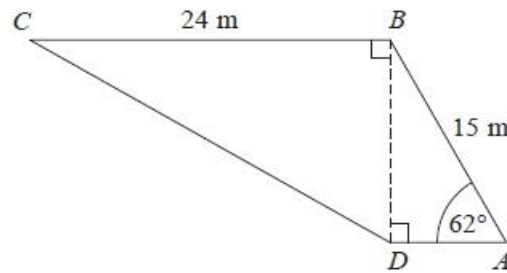


Diagram **NOT**  
accurately drawn

$AB = 15 \text{ m}$   
 $BC = 24 \text{ m}$   
Angle  $BAD = 62^\circ$

Work out the size of angle  $BCD$ .  
Give your answer correct to 1 decimal place.

.....°

**(Total for question = 5 marks)**

**Q7.** Steve is asked to solve the equation  $5(x + 2) = 47$ .

Here is his working.

$$\begin{aligned}5(x + 2) &= 47 \\5x + 2 &= 47 \\5x &= 45 \\x &= 9\end{aligned}$$

Steve's answer is wrong.

(a) What mistake did he make?

**(1)**

Liz is asked to solve the equation  $3x^2 + 8 = 83$

Here is her working.

$$\begin{aligned}3x^2 + 8 &= 83 \\3x^2 &= 75 \\x^2 &= 25 \\x &= 5\end{aligned}$$

(b) Explain what is wrong with Liz's answer.

**(1)**

**(Total for question = 2 marks)**

Q8. (a) Factorise  $3e^2 + 5e$

..... (1)

(b) Solve  $7(k - 3) = 3k - 5$

$k =$  ..... (3)

(c) Make  $a$  the subject of the formula  $f = \frac{a + 1}{2}$

..... (2)

(Total for Question is 6 marks)

Q9. Here is a parallelogram.

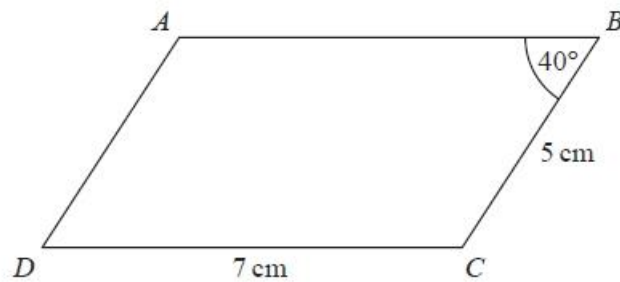


Diagram NOT accurately drawn

$DC = 7$  cm  
 $CB = 5$  cm  
Angle  $ABC$  is  $40^\circ$

Work out the area of the parallelogram.  
Give your answer correct to 1 decimal place.

..... cm<sup>2</sup>

(Total for question = 3 marks)

**Q10.**  $ABC$  is an isosceles triangle.

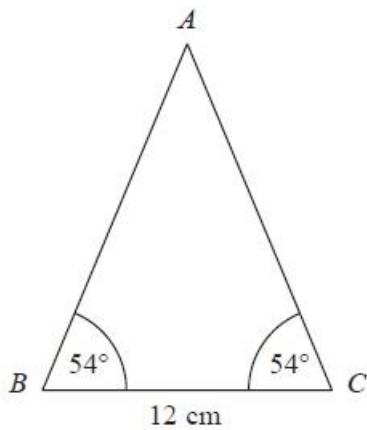


Diagram **NOT** accurately drawn

Work out the area of the triangle.

Give your answer correct to 3 significant figures.

..... cm<sup>2</sup>

**(Total for Question is 4 marks)**

**Q11.** Rob buys  $p$  packets of plain crisps and  $c$  packets of cheese crisps.

(a) Write down an expression for the total number of packets of crisps Rob buys.

**(1)**

The formula

$$F = 1.8C + 32$$

can be used to convert between temperatures in degrees Celsius ( $C$ ) and temperatures in degrees Fahrenheit ( $F$ ).

(b) Change 28° Celsius into degrees Fahrenheit.

**(2)**

(c) Solve  $4x + 2 = 20$

**(2)**

(d) Factorise  $3x^2 - 2x$

**(1)**

**(Total for question = 6 marks)**

Q12. (a) Solve  $f + 2f + f = 20$

$f = \dots\dots\dots$  (1)

(b) Solve  $18 - m = 6$

$m = \dots\dots\dots$  (1)

(c) Simplify  $d^2 \times d^3$

$\dots\dots\dots$  (1)

**(Total for question is 3 marks)**

Q13. The diagram shows the positions of a tower and a tree.

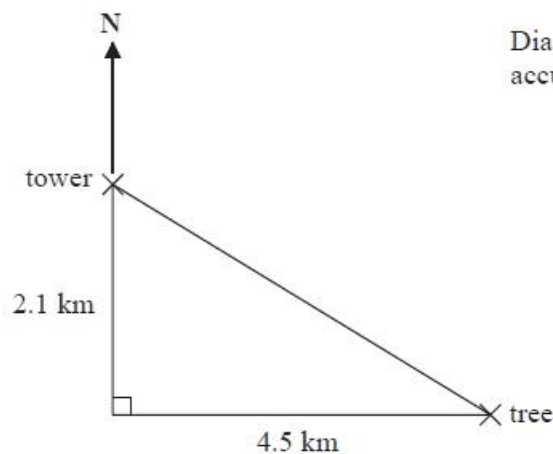


Diagram **NOT** accurately drawn

The tree is 2.1 km South of the tower and 4.5 km East of the tower.

(a) Work out the distance between the tower and the tree.  
Give your answer correct to one decimal place.

$\dots\dots\dots$  km (3)

(b) Work out the bearing of the tree from the tower.  
Give your answer correct to the nearest degree.

$\dots\dots\dots$  ° (4)

**(Total for Question is 7 marks)**

**Q14.**

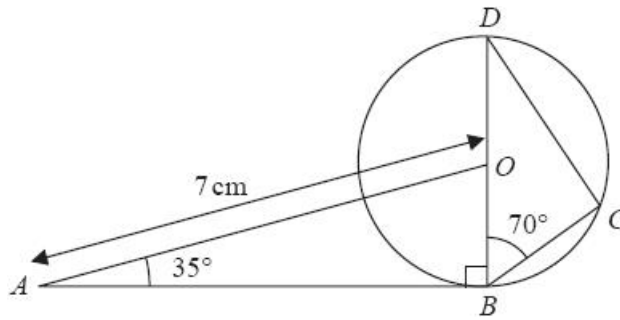


Diagram NOT  
accurately drawn

$B$ ,  $C$  and  $D$  are points on the circumference of a circle, centre  $O$ .  
 $BOD$  is a diameter of the circle.

$AO = 7$  cm    Angle  $ABO = 90^\circ$     Angle  $OAB = 35^\circ$     Angle  $DBC = 70^\circ$

\*(a) Explain why angle  $BCD$  is  $90^\circ$

(1)

(b) Calculate the length of  $BC$ .  
Give your answer correct to 3 significant figures.

..... cm (4)

**(Total for question = 5 marks)**