1 **(a)** Solve.

$5y^2 = 80$

(a) ..... **[3]**

(b) Rearrange this formula to make a the subject.

$4a - 3c = ac + 6$

(b) ..... **[4]**

2 **(a)** Calculate.

$$\sqrt{\frac{12.75}{9.6 \times 0.54}}$$

Give your answer correct to 2 decimal places.

(a) ..... **[2]**

(b) Insert **one pair** of brackets to make this calculation correct.

$$12 - 1 + 4 \times 3 = -3$$

[1]

3 **(a)** Evaluate.

(i) $\sqrt[3]{27}$

(a)(i) ..... **[1]**

(ii) $(\sqrt{7})^2$

(ii) ..... **[1]**

(iii) 4^0

(iii) ..... **[1]**

(b)* Express 6^{-1} as a recurring decimal.

(b) ..... **[3]**

4 A graph has this equation, where a and b are positive numbers.

$y = a(b^x)$

Here is a table of values for the graph.

x	0	2
y	3	75

(a) Use values from the table to find a and b.

(a) $a =$ .....

$b =$ ..... **[4]**

(b) Find the value of y when $x = 4$.

(b) ..... **[1]**

5 Multiply out and simplify.

$$(4 + \sqrt{3})(1 - \sqrt{3})$$

Give your answer in the form $a + b\sqrt{3}$ where a and b are integers.
Show all your working.

_____ **[3]**

6 Calculate.

(a) $\dfrac{3.36 + 139.2}{2.4 \times 1.25}$

(a) _____ **[1]**

(b) $\sqrt{6.2^3 - 7.288}$

(b) _____ **[1]**

7 **(a** Work out.

(i) the cube of 5

(a)(i) _____ **[1]**

(ii) $\sqrt{169}$

(ii) _____ **[1]**

(b) **(i)** Write as a single power of 5.

$5^6 \times 5^4$

(b)(i) _____ **[1]**

(ii) Write as a single power of r.

$\frac{r^{12}}{r^3}$

(ii) _____ **[1]**

(c) Find the value of the following.

(i) 16^0

(c)(i) _____ **[1]**

(ii) $27^{\frac{2}{3}}$

(ii) _____ **[2]**

8 **(a)** Complete this identity.

$$h \times h \times h \times h \times h \times h \equiv h^{\square}$$ **[1]**

(b) Harry is asked to write down the total weight of five onions each weighing m grams.
He writes $m5$ *grams*.

What should Harry have written?

(b) ..... grams **[1]**

(c) Decide whether each of the following is an equation, a formula, an identity or an expression.
For each one, put a tick (✓) in the correct column.

	Equation	**Identity**	**Formula**	**Expression**
$3x - 7 = 12$				
$s = ut - \frac{1}{2}gt^2$				
$\frac{4}{3}\pi r^3$				
$r^2 = a^2 + b^2$				

[3]

9 Simplify fully.

(a) $4\sqrt{7} + 8\sqrt{7} - 5\sqrt{7}$

(a) _____ **[1]**

(b) $(\sqrt{8})^4$

(b) _____ **[2]**

10 **(a)** Work out.

$$(\sqrt{3})^2$$

(a) _____ **[1]**

(b) Multiply out and simplify fully.

$$(4 + 5\sqrt{3})(2 + 7\sqrt{3})$$

You must show your working.

(b) _____ **[3]**

11 **(a)** Calculate.

$$\frac{\sqrt{3.2^2 + 4.7^2}}{9.7}$$

Give your answer correct to 2 decimal places.

(a) ..... **[2]**

(b) Insert one pair of brackets so that this calculation is correct.

$$3 \times 6 + 5 - 1 = 32$$

[1]

12 Arrange the answers to the following in order of size, starting with the smallest.

$\frac{1}{5}$ of 1200	14 squared	3^4	25% of 664

.... **[5]**

smallest

13 (a Calculate.

$$\sqrt{6.4^2 - 4 \times 9.03}$$

(a) _____ **[1]**

(b) (i) Write 540 as the product of its prime factors.

(b)(i) _____ **[3]**

(ii) Find the LCM (least common multiple) of 540 and 50.

(ii) _____ **[2]**

14 Calculate.

(a) $\dfrac{13.72 - 8.96}{8.4 \times 6.4}$

Give your answer correct to 3 decimal places.

(a) ..... **[2]**

(b) $\sqrt{80.2^3 + 250}$

Give your answer correct to the nearest 100.

(b) ..... **[2]**

15 (a Use your calculator to work these out.

(i) $\sqrt{6} + 1.2^3$
Give your answer correct to 2 decimal places.

(a)(i) _____ **[2]**

(ii) $\dfrac{3.7}{4.5 - 1.9}$

Give your answer correct to 2 significant figures.

(ii) _____ **[2]**

(iii) 2^{-4}
Give your answer as a decimal.

(iii) _____ **[1]**

(b) A newspaper recorded the attendance at a football match as 6500 correct to the nearest 100.

Write down the upper bound and lower bound of the attendance.

(b) Upper bound _____

Lower bound _____ **[2]**

16 Calculate.

(a) $\sqrt[3]{21.952^2}$

(a) _____ **[2]**

(b) $\dfrac{15.6 + 81.97}{4.3 \times 9.84}$

Give your answer correct to 2 decimal places.

(b) _____ **[2]**

(c) the reciprocal of 1.25

(c) _____ **[1]**