

7.2 Answers

GCSE (Year 10) Mathematics Percentages II

Answer 1

- (i) £10.20 <== must have £ sign and zero
- (ii) 567 kg
- (iii) 1624 bananas
- (iv) 60 %

[8 marks]

Answer 2

$$\frac{0.642}{5.97} \times 100 = 10.8 \%$$

In size Mars has about half the diameter of Earth but its density is far less.
It's thought that Jupiter migrated inward scooping up much of the material that would otherwise have become part of Mars. Fortunately (for Earth) the planets further out, especially Saturn, pulled Jupiter back out via complex gravitational 'tugs of war'.

[3 marks]

Answer 3

$$\text{Purchase cost : } 120 \times 4 = \text{£}480$$

$$\text{sales at £5 : } 60 \times 5 = \text{£}300$$

$$\text{sales at £7 : } 48 \times 7 = \text{£}336$$

$$\text{sales at £8 : } 12 \times 8 = \text{£}96$$

$$\text{Total sales : } \quad \quad \quad \text{£}732$$

$$\text{profit} = \frac{732 - 480}{480} \times 100 = 52.5\%$$

[5 marks]

Answer 4

$$20000 \times 1.015^3 = 20\,914 \text{ rupee}$$

[3 marks]

Answer 5

Question only asks for the interest !

$$\begin{aligned} 6000 \times 1.015^4 - 6000 &= 6368 - 6000 \\ &= 368 \text{ dirham} \end{aligned}$$

[3 marks]

Answer 6

64% is 40 litres

$$\Leftrightarrow 1\% \text{ is } 0.625 \text{ litres}$$

$$\Leftrightarrow 50\% \text{ is } 31.25 \text{ litres}$$

[3 marks]

Answer 7

(a) First 6 months : $6 \times 25 = 150$ cars

Second 6 months : $6 \times 45 = 270$ cars

Total : 420 cars

$$\begin{aligned}\text{Percentage increase} &= \frac{420 - 350}{350} \times 100 \\ &= 20\%\end{aligned}$$

[4 marks]

(b) Told that 8% is \$500 000

$$\Leftrightarrow 1\% \text{ is } \$62500$$

$$\Leftrightarrow 100\% \text{ is } \$6\,250\,000$$

[3 marks]

Answer 8

Originally, petrol cost 80 pence per litre

Now, petrol costs 125 pence per litre

$$\begin{aligned}\text{Percentage increase} &= \frac{125 - 80}{80} \times 100 \\ &= 56.25\%\end{aligned}$$

[3 marks]

Answer 9

$$\frac{136\,626\,025}{245\,289\,093} \times 100 = 55.7\% \text{ turn out}$$

[3 marks]

Answer 10

After increase Gopal's pay is : $20000 \times 1.08 = 21\,600$

$$\text{Percentage increase for Jamma : } \frac{21\,600 - 19\,200}{19\,200} \times 100 = 12.5\%$$

[4 marks]

Answer 11

(i) $E = 1 \times (3 \times 10^8)^2 = 9 \times 10^{16}$ joules

[3 marks]

(ii) $\frac{3.78 \times 10^7}{9 \times 10^{16}} \times 100 = 0.000\,000\,042\%$

[3 marks]

(iii) Almost none of the theoretical maximum energy within the petrol is being extracted by the engine. i.e. Almost 100% is 'lost'.

[2 marks]

Answer 12

Let x be area of the original square,

$$x \times 1.44 = 324$$

$$x = \frac{324}{1.44} = 225 \text{ cm}^2$$

So, original square has sides of length 15 cm, and increased square's sides are 18 cm.

$$\begin{aligned} \text{Percentage increase} &= \frac{4 \times 18 - 4 \times 15}{4 \times 15} \times 100 \\ &= \frac{18 - 15}{15} \times 100 \\ &= 20\% \end{aligned}$$

[4 marks]

Answer 13

$$\text{Percentage increase} = \frac{5.7 - 3}{3} \times 100 = 90 \% \text{ increase}$$

[3 marks]

Answer 14

Let x be the price of a new Mini, in which case, $x \times 0.85^6 = 4450$

$$= \frac{4450}{0.85^6}$$

$$p\# = \text{£}11\,800$$

[3 marks]

Answer 15

Let z be the side length of the original cube, so z^3 is its volume.

The volume of the increased cube will be,

$$\begin{aligned} z^3 \left(1 + \frac{x}{100} \right)^3 &= z^3 \left(1 + \frac{3x}{100} + \frac{3x^2}{10000} + \frac{x^3}{1000000} \right) \\ \text{Percentage increase} &= \frac{z^3 \left(1 + \frac{3x}{100} + \frac{3x^2}{10000} + \frac{x^3}{1000000} \right) - z^3}{z^3} \times 100 \\ &= 3x + \frac{3x^2}{100} + \frac{x^3}{10000} \end{aligned}$$

[6 marks]

Answer 16

Penny will get the cheque between her 17th and 18th birthdays

(After about 17 years, 8 months, and 6 days)

[6 marks]