Estimation Exam Practice

Q1. Work out an estimate for the value of 16×38

$$20 \times 40$$

Answer:___**800**___

(2 marks)

Q2. Work out an estimate for the value of 367×29

$$400 \times 30$$

Answer:___**12000**___

(2 marks)

Q3. Work out an estimate for the value of $\frac{27.5 \times 18.2}{12.9}$

$$\frac{30 \times 20}{10}$$

$$= \frac{600}{10}$$

Answer:___**60**___

(2 marks)

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Q4. Work out an estimate for the value of $\dfrac{15.2 \times 31.8}{0.55}$

$$\frac{20 \times 30}{0.5} = \frac{600}{0.5}$$

Answer: 1200

(2 marks)

Q5. Estimate the value of 0.0726×194.3281

$$0.07 \times 200$$

Answer: 14

(3 marks)

Q6. Estimate the value of $246 \div 0.043$

$$200 \div 0.04$$

Answer: 5000

(2 marks)

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Q7. Work out an estimate for the value of $\dfrac{16.2 + \sqrt{887.3}}{0.045}$

$$\frac{20 + \sqrt{900}}{0.05}$$

$$= \frac{20 + 30}{0.05}$$

$$= \frac{50}{0.05}$$

Answer: 1000

(2 marks)

Q8. Work out an estimate for the value of $\dfrac{\sqrt{98}}{\sqrt[3]{7.63}}$

$$\frac{\sqrt{100}}{\sqrt[3]{8}}$$

$$= \frac{10}{2}$$

Answer: 5

(2 marks)

Q9. a) Round 0.00374 to 1 significant figure.

Answer: 0.004

(1 mark)

b) Hence estimate the value of $\dfrac{0.00374}{0.0821}$

$$\frac{0.004}{0.08} = \frac{4}{80} = \frac{1}{20}$$

Answer: 0.05

(2 marks)

Q10. Work out an estimate for the value of $20\pi - 6.43$

$\pi \approx 3 \Rightarrow \quad 20 \times 3 - 6$

$\quad = 54$

Answer: _____54_____

(2 marks)

Q11. The value of the number e is approximately 2.71728.
Estimate the value of $300e + 46$

$300 \times 3 + 46$

$= 946$

Answer: _____946_____

(3 marks)

Q12. Choose which of these sums could be estimated by the value 15:

A) 2.85×5.78 B) $\frac{320.5}{10.76}$ C) $\frac{0.453}{0.028}$ D) 11.2% of 145   E) 0.029×487

3×6 $\frac{300}{10} = 30$ $\frac{0.5}{0.03}$ $10\% \text{ of } 100$ 0.03×500

$= 18$ $\quad = \frac{50}{3}$ $= 10$ $= 15$

Answer: _____E_____

(2 marks)

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Problem Questions:

Q13. a) Rana drives 74 km a week. Estimate the number of miles she
     drives in a year.

$$70 \times 50 = 3500$$

Answer:____3500 miles____

(2 marks)

b) Is your answer to part (a) an over or under estimate? Explain
   your reasoning.

under-estimate: $74 \longrightarrow 70$

$52 \longrightarrow 50$

so both numbers were smaller than the actual ones

Answer:____under-estimate____

(2 marks)

Q14. Light travels at 186,232 miles a second. Estimate how far light
     travels in an hour.

In 1 min: $200\,000 \times 60 = 12,000,000$

In 60 min: $12,000,000 \times 60 = 720,000,000$

(note: mark-schemes would generally allow
   a '2nd rounding' also, ie, $12,000,000 \longrightarrow 10,000,000$
      before $10,000,000 \times 60 = 600,000,000$ miles)

Answer:____720,000,000 miles____

(3 marks)

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Q15. A field in the shape of a square has an area 8752 m². Estimate the perimeter of the field.

Side length : $\sqrt{9000}$ = 30m

perimeter = 4 × 30
= 120

Answer: 120m

(2 marks)

Q16. Ray goes for a run every day. His route is to run from his house to the park which is 3.4 miles away, then around the park which is 0.85 miles, Estimate the number of yards he will run in a year.
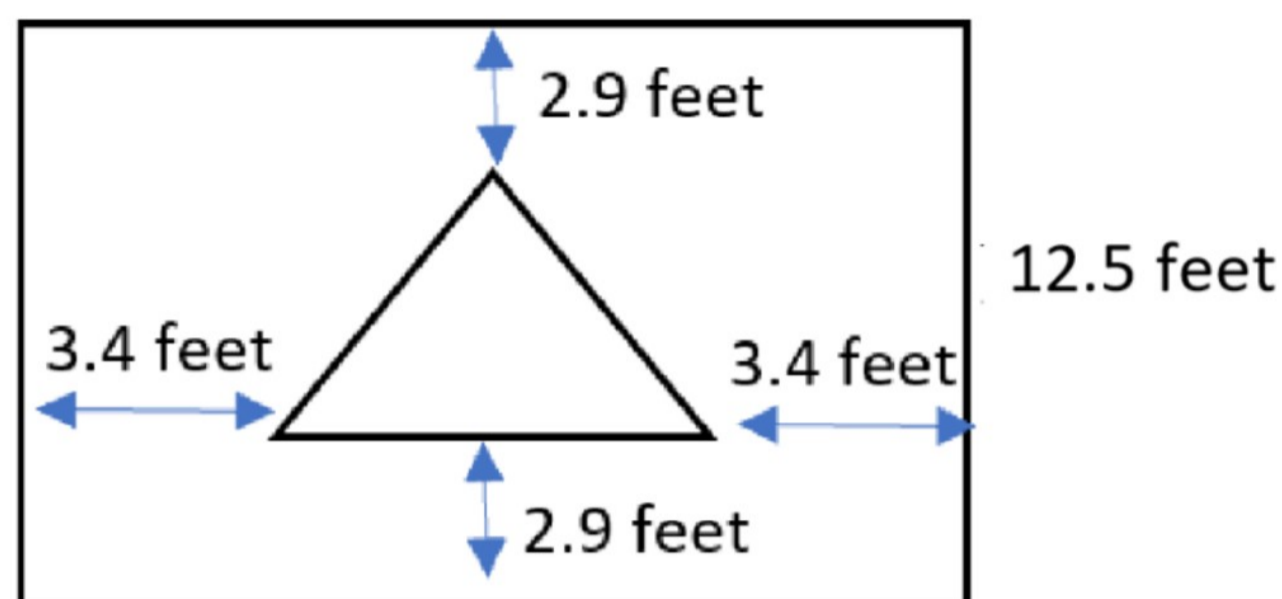
[You are given that **1 mile = 1760 yards**]

- 3 + 1 = 4 miles each day

- 4 × 400 = 1600 miles a year (365 → 400)

- 1600 × 2000
= 32 00 000 yards a year

Answer: 3,2 00,000 yards

(4 marks)

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Q17. Below is a garden consisting of a rectangular lawn with a triangular flower bed inside it.
Work out an estimate for the area of the of the lawn.

2.9 feet

12.5 feet

3.4 feet   3.4 feet

2.9 feet

16.2 feet

We Round each length to 1 s.f. and then proceed as normal.

- Flower bed base : $20 - 3 - 3 = 14$ ft.

- flower bed height : $10 - 3 - 3 = 4$ ft

- Flower bed area : $\frac{1}{2}(14 \times 4) = 28$ ft^2 (*)

- Area garden : $20 \times 10 = 200$ ft^2

- Area lawn : $200 - 28 = 172$ ft^2

(*) Again most mark-schemes would allow $\frac{1}{2}(10 \times 4) = 20$ here also.

Answer:___172 ft^2___

(5 marks)

Q18. a) Emma earns £11.46 an hour as a waitress. She also gets £4.78 each evening in tips. Emma works 7 evenings a work for 4 hours. Work out an estimate for her total weekly pay.

- $(4 \times £10) + £5 = £45$ per evening

- $7 \times £45 = £315$

(or $7 \times £40 = £280$ acceptable too)

Answer: £315

(2 marks)

b) Is your answer to part (a) an over-estimate, an under-estimate or cannot say? Explain your reasoning.

Cannot say; one number (£11.46 was rounded down, the other number £4.78 was rounded up)

Answer: Cannot say

(2 marks)

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