

Intermediate Diagnostic test for Number **7.483314**

1. Use a calculator to work out  $\sqrt[3]{56}$
- a) write down your answer **7.48**
  - b) round your answer to 2 decimal places
  - c) round your answer to 2 significant figures **7.5**

2. Put these fractions in order of size, starting with the smallest

$$\frac{1}{2}, \frac{2}{5}, \frac{3}{11}, \frac{8}{11}$$

$$\frac{3}{11} < \frac{2}{5} < \frac{1}{2} < \frac{8}{11}$$

**Use decimals or equivalent fractions**

3. Put these decimals in order of size, starting with the largest

$$34.567 \quad 45.568 \quad 34.4002 \quad 34.399999$$

**2 1 3 4**

4. **Estimate** the answer to

$$\frac{39.5 \times 9.9}{8.1} \quad \text{You MUST show your working} \quad \frac{40 \times 10}{8} = 5 \times 10 = 50$$

5. Work out the price of a car originally costing £3000, if I am offered a 15% discount off that price.

$$0.85 \times 3000 = \text{£}2550$$

6. Work out

a)  $\frac{2}{5} + \frac{3}{8}$   $\frac{16}{40} + \frac{15}{40} = \frac{31}{40}$

b)  $\frac{2}{3} - \frac{4}{15}$   $\frac{20}{30} - \frac{8}{30} = \frac{12}{30} = \frac{2}{5}$

c)  $\frac{3}{5} \times \frac{6}{7}$   $\frac{18}{35}$

d)  $\frac{2}{9} \div \frac{3}{5}$   $\frac{2}{9} \times \frac{5}{3} = \frac{10}{27}$

7. I buy a 1 kg bag of flour for 43p. A special offer tells me that I can buy 3 bags of 500grams of flour for the price of 2. These cost 30p each. Which deal offers better value for money?

Show your working.

**1 kg is 43p**

**1.5kg is 60p**

**There are lots of ways to do this.**

**I am going to x 1kg by 1.5**

$$43p + 21.5p = 64.5p$$

**So the special offer is better value.**

8. a) Express 100 as a product of its primes  $100 = 2^2 \times 5^2$

b) express 128 as a product of its primes  $128 = 2^7$

c) find the highest common factor of 100 and 128  $2^2 = 4$   
 $(\text{lcm} = 2^7 \times 5^2 = 3200)$

9. Two students share £81 in the ratio 4:5. How much do they each get?

$1 \text{ part} = \text{£}9$

1<sup>st</sup> student £36      2<sup>nd</sup> Student £45

10. Work out :

a)  $5^3 = 125$    b)  $2^7 = 128$    c)  $\sqrt[3]{27} = 3$    d)  $3.4 \times 10^3 = 3400$

11. Work out the following, giving your answer in standard form:

a)  $2.3 \times 10^4 \times 4.8 \times 10^3 = 11.04 \times 10^7 = 1.104 \times 10^8$

b)  $3.4 \times 10^2 + 4.5 \times 10^3 = 4840 = 4.84 \times 10^3$

12. A bag cost £23. It had increased 10% in price since the previous year. How much had it cost the previous year?

$110\% = 23$

$1\% = 0.209$

13. Sam scores 20 out of 26 in a test. Write this score as  $100\% = \text{£}20.91$

a) a fraction in its lowest terms  $10/13$

b) a percentage  $77\%$

14. Work out the cost of 53 bags of potatoes at £ 2.12 a bag.  $\text{£}112.36$

15. If I spend £67.84 on potatoes how many bags did I buy?  $32$

**16. Express in the form  $a\sqrt{b}$ :**

a)  $\sqrt{28} = 2\sqrt{7}$

b)  $5\sqrt{3} + 2\sqrt{75} = 5\sqrt{3} + 10\sqrt{3} = 15\sqrt{3}$

c)  $\frac{5}{3\sqrt{2}} = \frac{5 \times 3\sqrt{2}}{3\sqrt{2} \times 3\sqrt{2}} = \frac{15\sqrt{2}}{18} = \frac{5\sqrt{2}}{6}$

**Simplify:**

d)  $\frac{4+\sqrt{5}}{4-\sqrt{5}} \times \frac{4+\sqrt{5}}{4+\sqrt{5}} = \frac{16+8\sqrt{5}}{16-5} + 5 = \frac{21+8\sqrt{5}}{11}$

17. Express 0.4567567567.. as a fraction

**let  $x = 0.4567567$**

**$1000x = 456.7567$**

**$999x = 456.3$**

**$9990x = 4563$**

**$x = \frac{4563}{9990}$**

**$= \frac{507}{1110}$**

**$= \frac{169}{370}$**

18. Fred invests £450 for 25 years at 3% pa  
How much will he have after the 25 years?

**$450 \times 1.03^{25}$**

**$=£942.20$**