UNIT 5

Approximation, Estimation and Use of Calculator

Revision Notes

1. We can **approximate** the value of a number by
   (a) rounding it off to a given **place value**.
   (b) rounding it off to a given number of **decimal place**.
   (c) rounding it off to a given number of **significant figures**.

2. **Significant** figures
   (a) All non-zero digits are significant.
   (b) All **zeroes that appear between non-zero digits** are significant.
   E.g. 4105 has 4 significant figures.
   (c) All zeroes in front of the **first non-zero digit** are non-significant.
   E.g. 0.0005 has 1 significant figure.
   (d) The zeroes **after the non-zero digits** may be considered significant.
   E.g. 1500 can be considered as having 2, 3 or 4 significant figures.

3. We can use **estimation** to check if our answers make sense.

4. Some **basic keys** on a scientific calculator.
   (a) [0] [1] [2] [3] [4] [5] [6] [7] [8] [9] are the keys representing the 10 digits.
   (b) [+] [−] [×] [÷] are the keys representing the 4 basic operations.
   (c) [=] is the equal key.
   (d) [C] is the clear key.
   (e) [AC] is the all-clear key.
   (f) [(] [)] are the bracket keys.
   (g) [.] is the decimal point key.

(h) $\boxed{a\frac{b}{c}}$ is the fraction key.

(i) $\boxed{x^2}$ is the square key.

(j) $\boxed{\sqrt{x}}$ is the square root key.

(k) $\boxed{x^3}$ is the cube key.

(l) $\boxed{\sqrt[3]{x}}$ is the cube root key.

(m) $\boxed{x^y}$ is the index/power key.

(n) $\boxed{\sqrt[x]{x}}$ is the root key.

Revision Exercise 5

1. Round off each of the following to the nearest whole number.

   (a) 15.7 (b) 603.58

   (c) 2000.88

2. Round off each of the following to the nearest ten.

   (a) 238 (b) 61.5

   (c) 1008

3. Round off each of the following to the nearest hundred.

   (a) 499 (b) 100 349

   (c) 150.33

4. Round off each of the following to the nearest thousand.

   (a) 9 876 543 (b) 555 555

   (c) 798.6

5. Correct each of the following to 1 decimal place.

   (a) 111.111 (b) 99.385

   (c) 0.88

6. Correct each of the following to 2 decimal places.

   (a) 22.0544 (b) 0.0987

   (c) 0.005 14

7. Express each of the following correct to 1 significant figure.

(a) 0.043 21 (b) 8.294

(c) 543 (d) 0.999

8. Express each of the following in 2 significant figures.

(a) 1357 (b) 5.656

(c) 0.8 (d) 10.05

9. Express each of the folowing in 3 significant figures.

(a) 1 333 000 (b) 0.004 793 1

(c) 45.216 (d) 3.001 23

10. Estimate the value of $\frac{8.01 \times 5.98}{10.05}$. Give your answer correct to 1 significant figure.

11. Jonah wants to buy 5 pencils and 3 pens. Each pencil costs 85¢ and each pen costs $1.95. Estimate the total amount he has to spend.

12. Evaluate each of the following using a calculator. Give your answers correct to 2 decimal places where necessary.

(a) $(399 + 456) \div 30 + 1078$

(b) $\dfrac{18.23 \div 0.15 \times 6.5}{2.38 \times 1.5}$

(c) $100 \div (31.5 + 29.7)$

(d) $\left(4\frac{5}{9} + 3\frac{4}{7}\right) \times 6\frac{2}{5}$

(e) $\dfrac{1 + 1\frac{1}{2}}{2 - \frac{3}{5}}$

(f) $0.51 + 7\frac{6}{11} \times 3\frac{5}{11} - 9.9$

13. Evaluate the following.

(a) 8^2

(b) 100^2

(c) 1.1^2

(d) $\left(\frac{1}{2}\right)^2$

14. Evaluate the following.

(a) $\sqrt{196}$

(b) $-\sqrt{8100}$

(c) $\sqrt{10.24}$

(d) $\sqrt{2\frac{1}{4}}$

15. Evaluate the following.

(a) 4^3

(b) $(-50)^3$

(c) 12^3

(d) $\left(\frac{2}{3}\right)^3$

16. Evaluate the following.

(a) $\sqrt[3]{216}$

(b) $\sqrt[3]{\frac{8}{1000}}$

(c) $\sqrt[3]{-125}$

(d) $\sqrt[3]{0.027}$

17. Arrange the following in ascending order.

$\sqrt[3]{2}, \sqrt{3}, -2^3, 3^2, -\sqrt{\frac{2}{3}}$

18. Estimate the value of $\sqrt{16.01} + 2.99^2$. Give your answer correct to the nearest whole number.

19. Evaluate the following using a calculator.

(a) $(3^2 + 4^3) \div \sqrt{100}$

(b) $\dfrac{(4+7)^2}{\sqrt{4}}$

20. Evaluate each of the following using a calculator. Give your answer to 3 significant figures where necessary.

(a) $\sqrt[3]{150} + 15^2$

(b) $4^2 + \sqrt{10} \div 2^3 - \sqrt{20}$

(c) $\left(\sqrt[3]{100} + \sqrt{10}\right) \div 2^3$

(d) $\dfrac{\sqrt{99} + \sqrt[3]{9}}{99}$