**Unit**

**1**

**REPRESENTING NUMBERS**

KEY CONCEPTS

**TEACHER’S GUIDE**

An overview of numbers

**Real**

*π***, *e***

**Surds**

**Non-terminating decimals**

**Fractions**

**Irrational**

**Non-real**

**Numbers**

**Rational**

**Integers (Non-fractions)**

# Definitions

**Positive integers (Natural numbers)**

**Zero integer**

**Whole numbers**

**Negative integers**

**Prime factorisation** Factorising a number into its prime factors and displaying them as

index notation.

**Highest common factor** The highest number that can be divided exactly into each of two

or more numbers.

**Lowest common multiple** The lowest quantity that is a multiple of two or more given

quantities

**Standard Form (Scientific Notation)** A number expressed in standard form is written as *A*  10*n*, where

1 ≤ *A* < 10 and *n* is an integer.

# Useful Formulas

**Simple Interest** *I* = *PRT*

where *I* = interest amount,

*P* = principle,

*R* = interest rate (in percentage),

*T* = time in years

**Compound Interest** *A* = *P*$\left(1+\frac{ R }{n}\right)$*nT*

where *A* = total amount (principle + interest),

*P* = principle,

*R* = interest rate (in percentage),

*T* = time in years,

*n* = number of compounding periods in a year

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**Cube** Volume, *V* = $x^{3}$

*x*

Surface area, *A* = 6$x^{2}$ *x*

 *x*

**Cuboid** Volume, *V* = *l* × *b* × *h*

*b*

Surface area, *A* = 2(*l* + *b*)(*h*)

where *l* = length, *b* = breadth, *h* = height

*h*

*l*

**Cylinder** Volume, *V* = *πr*2*h*

 *r*

Surface area, *A* = 2*πr*2 + 2*πrh* where *r* = radius, *h* = height

*h*

**Prism** Volume, *V* = (base area) × height

Surface area, *A* = 2(base area) + (perimeter of base area)(height)

height

base area

**Pyramid** The pyramid shown here is a right pyramid where *E* is *F*

*A*

*E*

*M*

vertically below *F* and *FEM* = 90°.

Point *F* is called the vertex, *EF* is the height of the pyramid and *M* is the mid-point of *BC*. The base area is *ABCD*.

Triangles *FCB*, *FBA*, *FAD* and *FDC* are called the lateral faces

of the pyramid and *FM* is called the slant height. It is the *B*

perpendicular height of the lateral face.

The formula below is for a right pyramid with a square base.

Volume, *V* =$\frac{ 1 }{ 3 }×$base area × height *D C*

Surface area, *A* = (base area) + 4(area of lateral face)

Area for one lateral face=$\frac{ 1 }{2}$ × *BC* × *FM*

A non-right pyramid has different lateral faces. So the area formula will not apply.

Unit 1 **Representing Numbers**

**Cone** Volume, *V* =$\frac{ 1 }{3}πr^{2}$*h*

*h*

*l*

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Surface area, *A* = *πr*2 + *πrl*

where *r* = radius, *h* = height

*r*

**Sphere** Volume, *V* =$\frac{ 4 }{3}$ *πr*3

*r*

Surface area, *A* = 4*πr*2 where *r* = radius

**Hemisphere** A hemisphere is half of a sphere.

 *r*

Volume, *V* =$\frac{ 2 }{ 3 }$*πr*3

Surface area, *A* = 2*πr*2 + *πr*2 = 3*πr*2 where *r* = radius

There is an additional *π*r2 for the area as there will be an exposed circle for the hemisphere.

**Profit/Loss** Profit/Loss = Revenue – Cost

If revenue > cost, there is a profit. If cost > revenue, there is a loss.

If the value is positive, then it is a profit. If the value is negative, then it is a loss.

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# WORKED EXAMPLES

**Level 1**

## Worked Example 1

Express 84.21 as a proper fraction.

Solution

qn and 84$\frac{21}{100}$ will be displayed.

 **ClassWiz steps**

Press 84.21=. Press

84.21 = 84$\frac{21}{100}$

## Worked Example 2

Express $\frac{17}{21}$ in decimals corrected to 3 significant figures.

Solution

 **ClassWiz steps**

Press 17a21=. Press

n and 0.809523… is displayed.

 $\frac{17}{21}$=0.809 523… = 0.810 (3 s.f.)

## Worked Example 3

Express$\frac{ 1 }{3}$ as a recurring decimal.

Solution

 $\frac{ 1 }{3} $=0$.\dot{3}$

|  |  |
| --- | --- |
|  | Press 1a3 to get $\frac{ 1 }{3}$.Press n to get the decimalof 0.33333333333… and writeas a recurring decimal of 0.$\dot{3}$.  |
| 　　　　　　 | $\dot{3 }$would suffice. It is unnecessary 　　to write 0. $\dot{3}\dot{3}$ or 0.$\dot{3}\dot{3}\dot{3}$ . |

 **ClassWiz steps**

## Worked Example 4

Express 0.$\dot{1}\dot{7}\dot{7}$ as a fraction.

 **ClassWiz steps**

Press 0.17171717171717=

to get $\frac{17}{99}$.

Solution

*Method 1*

0.$\dot{1}\dot{7}$= $\frac{17}{99}$

Press in the calculator 0.17171717171717171717 and press the equal sign to get the fraction. If you don’t get the fraction, try pressing more sets of the recurring values. If it still does not work, use method 2 to help.

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Method 2

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This is an algebraic solution. You may use this solution if the calculator does not help to display the fraction automatically.

 0.$\dot{1}\dot{7}$ × 100 = 17.$\dot{1}\dot{7}$

By subtracting 0.$\dot{1}\dot{7}$ from both sides of the equation,

0.$\dot{1}\dot{7}$× 100 – 0.$\dot{1}\dot{7}$= 17. $\dot{1}\dot{7} –0.\dot{1}\dot{7}$

0.$\dot{1}\dot{7}$×99= 17

0.$\dot{1}\dot{7}$= $\frac{17}{99}$

## Worked Example 5

Calculate 47% of $598.

Solution Method 1

 **ClassWiz steps**

Press

47a100O598.

 $\frac{47}{100}$× 598 = $281.06

Method 2

47% × 598 = $281.06

 **ClassWiz steps**

Press

47&O598.

Both methods will give you the same answer.

## Worked Example 6

Express 17 640 in index notation.

Solution

 **ClassWiz steps**

Press 17640=. Press

qx and 23 × 32 × 5 × 72 will be displayed.

17 640 = 23 × 32 × 5 × 72.

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***Worked Example 7***

Express 472.3829 in standard form, giving your answer to 3 significant figures.

Solution

472.3829

Refer to the definition of standard form.

= 4.723829 × 102

= 4.72 × 102 (to 3 s.f.)

 **ClassWiz steps**

Press 472.3829=. Press qw for L. Press 3 for Number Format. Press 2 for Sci. Press 3 for 3 significant figures in your answer. Press = and 4.72 × 102 is displayed.

***Worked Example 8***

Evaluate $\frac{\sqrt{3672}+293}{\sqrt[4]{964}×56}$, giving your answer to 3 significant figures. Solution

 **ClassWiz steps**

Press a (s3672$+293) R4q^964$O56 and 1.133186… will be displayed.

 $\frac{\sqrt{3672}+293}{\sqrt[4]{964}×56}$ = 1.13 (3 sig.fig.)

***Worked Example 9***

Evaluate 9.1$\dot{9}$ + $\frac{1}{14}$.

Solution

 **ClassWiz steps**

Press

9.19999999999=

in the calculator and $\frac{46}{5}$ will be displayed.

9.1$\dot{9}$ +$\frac{1}{14}$ =$ \frac{46}{5}$ +$ \frac{1}{14}$

= $\frac{649}{70}$

***Worked Example 10***

Without using a calculator, estimate $\frac{4.88+7.33}{2.10×3.88}$ × 5.92, giving your answer to 3 significant figures.

Solution

 $\frac{4.88+7.33}{2.10×3.88} $× 5.92 = $\frac{5+7}{2×4}$ × 6

Since the calculator is not allowed, round off each term to the nearest whole number.

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= 9

Unit 1 **Representing Numbers**

## WORKED EXAMPLE 11

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Jennifer wants to place $30000 in a Bank.

1. Bank A offers 5% simple interest per annum for 4 years. Calculate the total amount Jennifer has in the account at the end of 4 years.
2. Bank B offers 5% compound interest per annum for 4 years, compounded annually. Calculate the total amount Jennifer has in the account at the end of 4 years.

Solve the questions using spreadsheet function ClassWiz calculator.

Solution

###  ClassWiz steps

Press w8 for the spreadsheet function.

Key in 30000= in cell B1 and 1, 2, 3, 4 in cell A2 to A5 respectively to represent the number of years.

In cell B2, key in Qx1O0.05= to obtain the amount of interest earned per year. The value is 1500.

Since it is simple interest, the following years will also yield $1500 for the amount of interest. Key in 1500 into cells B3, B4 and B5.

Next, in cell B6, you want to find the total sum of money in the bank account at the end of 4 years. Press TRRR4 to select the “Sum” formula.

Press Qx1QyQx5). You should have keyed in this:

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Press = and the total sum of $36000 will be displayed.

Hence, at the end of 4 years, the total amount of money in the bank account is $36000.

###  ClassWiz steps

Without changing the spreadsheet, you may key the values for compounding interest in the column C so that you can compare the final result.

In cell C1, key in 30000=.

In cell C2, Press T1 to select “Fill Formula” function.

Key in Q/1O1.05= to input the formula “C1×1.05” and

R$$$$$$o5= to input the range from C2:C5. This is how it should look like:

Press = and you should see the values filled up like this:

In cell C4, the value is already computed to be the total amount of money in the bank account at the end of 4 years.

Hence, at the end of 4 years, the total amount of money in the bank account is $36465.

Unit 1 **Representing Numbers**

# CLASSWIZ WORKSHEETS

**CLASSWIZ WORKSHEETS**

**Level 1**

 **ClassWiz set-up**

You may press qn to change the improper fractions to proper fractions.

1. Express each of the following numbers as proper fractions.

|  |  |  |
| --- | --- | --- |
| (a) 0.1278 | (b) 3.854 | Teachers please note that the calculator cannot display the answer directly for (d). Do use the concept for (c) to help the students to arrive at the answer for (d). |
| (c) 1.293 | (d) –1.2933 |
| (e) 0.0426 | (f ) –9.037 |
| (g) 293.73 | (h) –8.392 | (i) –10.383 |
| (j) 5.394 | (k) 7.391 | (l) –0.2406 |

1. Express each of the following numbers in decimals corrected to 3 significant figures.

|  |  |  |
| --- | --- | --- |
| (a) $\frac{273}{292}$  | (b) – $\frac{903}{2992}$ | (c) $\frac{3721}{1062}$ |
| (d) 1$\frac{931}{1011}$ | (e) $\frac{748}{23}$ | (f ) 4 $\frac{2}{102}$ |
| (g) $\frac{562}{182}$+ 21.3 | (h) $\frac{391}{100}$ – 6. 482 | 1. $\frac{-478.2}{1930}$ + 2.482
 |
| (j) $4\left(\frac{321}{283}\right)$ | (k) 49.3 × $\frac{124}{-886}$ | (l) –2$\frac{73}{2710}$ + 5.239 |

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**CLASSWIZ WORKSHEETS**

1. Express each of the following fractions as a recurring decimal.

|  |  |  |
| --- | --- | --- |
| (a) 3$\frac{1}{33}$ | (b) $\frac{32}{9}$ | (c) $2\frac{17}{18}$ |
| (d) $\frac{20}{6}$ | (e) $\frac{4}{27}$ | (f ) $\frac{91}{99}$ |
| (g) $\frac{200}{54}$ | (h)$ \frac{278}{9}$  | (i) $5\frac{22}{108}$ |
| (j) $\frac{100}{36}$ | (k) $\frac{25}{3}$ | (l) $\frac{421}{54}$ |

1. Express each of the following recurring decimals as an improper fraction.

|  |  |  |
| --- | --- | --- |
| (a) 1.1$\dot{3}$ | (b) 1.$\dot{1}\dot{5}$ | (c) 6.$\dot{2}\dot{4}$ |
| (d) 3.$\dot{9}\dot{2}\dot{7}$ | (e) 23.09$\dot{2}$ | (f ) 2.$\dot{0}\dot{9}$ |
| (g) 3.0$\dot{3}\dot{8}$ | (h) 8.$\dot{1}$ | (i) 11.$\dot{8}\dot{6}$ |
| (j) 17.$\dot{7}\dot{7}\dot{8}$ | (k) 13.00$\dot{7}$ | (l) 5.3$\dot{7}\dot{5}$ |

Unit 1 **Representing Numbers**

5. Calculate each of the following, leaving your answer to 2 decimal places when it is non-exact.

 **ClassWiz set-up**

Press L312 for the calculator to display 2 decimal places for the final answer.

**CLASSWIZ WORKSHEETS**

|  |  |  |
| --- | --- | --- |
| (a) 29% of 5 km | (b) 18.3% of $289 | (c) 409% of 22 units |
| (d) 77% of 15 m | (e) 34.85% of 17 kg | (f ) 1.11% of 283 m3 |
| (g) 20.$\dot{3}\dot{2}$% of 20 g | (h) 16$\frac{5}{13}$ % of $888 | (i) 0.07% of 9023 cm3 |
| (j) 182.$\dot{6}\dot{1}$% of 15.7 cm | (k) 278.3% of $29 | (l) $\frac{493}{12}$ % of 2.92 units |

 6. Evaluate each of the following exponential functions, leaving your answer in 3 significant figures if it is not

 **ClassWiz set-up**

Press ^ if you want to input the power.

 exact.

|  |  |  |
| --- | --- | --- |
| (a) 22 | (b) 33.5 | (c) –180.5 |
| (d) e0.1 | (e) 5 × 42.8 | (f ) 7(63) |
| (g) $\frac{ 1 }{3}$ (–*e*2)  | (h) (7.$\dot{2}$)3  | (i)$ \frac{11^{3.3}}{13}$  |
|  (j) $94^{\frac{ 1 }{3}}$ | (k) 13.3–1.45 | (l) –42 × 93–e |

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**CLASSWIZ WORKSHEETS**

1. By using prime factorisation, express each of the following in index notation.

 **ClassWiz set-up**

Press qx for the Prime Factorisation function.

|  |  |  |
| --- | --- | --- |
| (a) 84 | (b) 275 | (c) 364 |
| (d) 1188 | (e) 4165 | (f ) 2800 |
| (g) 30888 | (h) 4725 | (i) 1276 |
| (j) 5967 | (k) 1242 | (l) 4199 |

1. Express each of the following numbers in standard form, giving your answer to 3 significant figures.

 **ClassWiz set-up**

Press L323 for the calculator to display the answers in standard form rounded off to 3 significant figures.

|  |  |  |
| --- | --- | --- |
| (a) 100 | (b) 1038 | (c) 0.0263 |
| (d) 392.293 | (e) 0.3813 | (f ) 70927 |
| (g) 0.9289 | (h) 10.005 | (i) 0.02975 |
| (j) 39.91 | (k) 55.829 | (l) 78.206 |

Unit 1 **Representing Numbers**

1. Evaluate each of the following surds, giving your answer to 3 significant figures.

 **ClassWiz set-up**

You may use the s function.

**CLASSWIZ WORKSHEETS**



|  |  |  |
| --- | --- | --- |
| (a) $\sqrt{30}$  | (b)$\sqrt[3]{320}$ | (c) $\sqrt[4]{2673}$ |
| (d) $\sqrt[4]{3568}$ + 36 | (e) 2 ×$\sqrt{492}$ | (f ) 4($\sqrt[3]{-788}$) + 3 |
| (g) $\frac{\sqrt{462}}{18}$  | (h) $\sqrt{\sqrt{37891}}$ | (i) $\frac{37}{\sqrt[3]{489}}$ |
| (j) $\frac{7\sqrt{32}}{\sqrt[3]{946}} $ | (k)$ \frac{5\sqrt[4]{456}}{\sqrt{8\sqrt{92}}}$ | (l)$ \frac{6\left(\sqrt[3]{-3619}\right)}{\sqrt{27}-2}$ |

10. Write down the reciprocal of each of the following numbers.

 **ClassWiz set-up**

You may press 1a and key in the given expressions to find the reciprocal.

|  |  |  |
| --- | --- | --- |
| (a) 38 | (b) 73 | (c) –193 |
| (d) 5.93 | (e) –*e*2 | (f) $\frac{4}{69}$ |
| (g)$1\frac{1}{2}$ | (h) –3.$\dot{3}$ | (i) $\sqrt{32}$ |
| (j) $\frac{-32}{\sqrt[3]{27}}$ | (k) $\frac{7\sqrt{15}}{3}$ | (l) $\frac{4-\sqrt[3]{-1728}}{\sqrt{16}}$ |

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**CLASSWIZ WORKSHEETS**

1. Evaluate each of the following rational numbers.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| (a) | 72 – 9 × 3 | (b) | 278 ÷ (22 – 17) | (c) –9 × 8 + 27.5 |
| (d) | 5 × 24 + 15 ÷ 3 | (e) | $-2.77^{2}$ +$\frac{27}{12}$ | (f ) | $\frac{74}{13}$+ 14.$\dot{3}$ |
|  |   |  |  |  |  |
| (g) |  $\sqrt{64}$×$\frac{1}{12}$+ 3.9 | (h) | 6.$\dot{2}\dot{9}$ × $\frac{63}{92}$ | (i) | $\sqrt[3]{343}$× 3.$\dot{4}\dot{8}$ |

1. Evaluate each of the following irrational numbers, giving your answer to 3 significant figures.

|  |  |  |
| --- | --- | --- |
| (a) *π* + *e* | (b)12$\sqrt{12}$ | (c) *e*2 × 7.38 |
| (d) $9^{\frac{1}{3}}$ + $\sqrt{1.73}$ | (e) $\frac{-12}{\sqrt[3]{78}} $÷ 0.$\dot{3}$ | (f ) $\frac{2\sqrt{6}}{7}$ – $\frac{e}{3}$ |
|  (g) $\frac{754.\dot{7}}{83}$× $\frac{π}{4}$ | (h) (–5.3)2 + $\frac{27}{\sqrt{18}}$ | (i) $569^{\frac{2}{3}}$ ÷ $\sqrt[3]{9}$ |

Unit 1 **Representing Numbers**

13. Use a calculator to evaluate each of the following, giving your answer to 3 significant figures.

**CLASSWIZ WORKSHEETS**

|  |  |
| --- | --- |
| (a)$ 236.3^{\frac{1}{4}}$+ 7.3912 | (b) $\frac{\sqrt{125.12}+78.3}{36.918}$ |
| (c) 29.8467 – $\frac{\sqrt[3]{392.43}}{13.96}$ | (d) 25.18 ÷ 15.882 + 9.99 × 3.2 |

14. Without using a calculator, estimate the value of each of the following, giving your answer to 3 significant figures.

|  |  |
| --- | --- |
| (a) 22.9 – 9.1 × 3.9 | (b) 79.89 ÷ 20.39 – 15.77 |
| (c) 2.78 × (–5.33) + 14.91 | (d) $\frac{3.21×4.13}{2.19}$ + 16.2 ÷ 3.88 |

# Level 2

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**CLASSWIZ WORKSHEETS**

1. It takes 10 minutes to fill up a container that is 40 cm by 30 cm by 20 cm. Calculate the average rate of flow of water, in cm3/min, into the container.
2. Petrina can finish crafting 23 ribbons in 1 hour. Calculate the minimum duration, to the nearest minute, that she needs to craft 473 ribbons.
3. Janice can bake 378 cupcakes in 3 hours and 45 minutes. Calculate her average speed of baking in cupcake/minute.
4. The height of a burning candle decreases by 4.6 cm in a minute. Given that the height of the candle is 22 cm, find the minimum time taken for the candle to be burnt completely, giving your answer to the nearest minute.
5. Ivy has 5 times as many candies as Shawn. Given that they have a total of 48 candies, calculate how many more candies does Ivy have.

Unit 1 **Representing Numbers**

**CLASSWIZ WORKSHEETS**

1. Kim has 5 marbles and Peter has 6 times as many marbles as Kim. Adeline has $\frac{1}{ 3 }$ more marbles than

Peter. Calculate the number of marbles that Adeline has.

1. In a competitive race, the women have to complete a distance of 5 km and the men have to complete a distance of 8 km. Given that Jane runs at a speed of 6 km/h, find the minimum speed that Zac have to run at so that he is not slower than Jane.
2. Jerald has 6 apples and Phillip has more apples than Jerald. After Jerald gave Phillip 3 apples, Phillip has 8 times more apples than Jerald. Find the original number of apples that Phillip has.
3. It takes John 45 minutes to reach Town A by bus and 27 minutes by car. Given that the bus is travelling at 55 km/h, calculate the speed of the car.
4. Fred bought a laptop at $1839 and later sold it at a profit of 8.5%. Calculate the selling price of the laptop.

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**CLASSWIZ WORKSHEETS**

1. Given that Tammy lost 35% of her investment principle of $15 629.32, find the amount of money that she lost.
2. Kenny’s total start-up cost for his online business is $7800. Given that he earns an average of $2570 per month from this business, find the total amount of profit he makes after 7 months.
3. Geraldine sold her shoes at an 18% loss for $20. Calculate the price that Geraldine first paid for her shoes.
4. Jennifer made a profit of $2353 on her investments in January and a loss of $1379 in February. Calculate how much she needs to make in March such that her total overall profit at the end of March is $3500.
5. Evelyn buys some sportswear selling at $55.30, exclusive of GST (goods and service tax). Given that the GST cost $3.61, calculate the total amount Evelyn has to pay.

Unit 1 **Representing Numbers**

1. At a restaurant, the total bill for Nigel’s meal is $38.59, inclusive of service charge and GST. Given that the service charge and GST cost $5.80, calculate the cost for the food.

**CLASSWIZ WORKSHEETS**

1. A company sells shirts for $14.99 each, inclusive of the cost for 10% GST. Given that the company sold 7800 shirts in a month, calculate the total amount of GST the company needs to pay for that month.

1. Keagan’s meal cost $19.99 before a service charge of 12%. Calculate the total bill he needs to pay for the meal.
2. Carl puts his savings of $13 500 in a bank account which gives a simple interest of 1.25% per year. Calculate how much money will be in his bank account after 3 years.
3. Jimmy placed $382 000 in a 5-year fixed deposit scheme which pays out 2% compound interest per annum. Calculate the total amount of interest Jimmy will earn from this 5-year fixed deposit scheme.

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**CLASSWIZ WORKSHEETS**

1. Henry decided to save $53 000 with Bank A where they offer a 4% interest rate per annum, compounded quarterly. Calculate the total amount of savings in the bank after 7 years.
2. Jacqueline invests $40 000 in a plan that offers an interest rate of 3% per annum, compounded half- yearly for 2 years. Express the total amount of interest as a percentage of the principle.
3. Dave bought an investment plan with $109 000 which gives a simple interest of 2.5% yearly for 18 years. Calculate the total amount of interest he can earn at the end of this investment plan.
4. Calculate the highest common factor (HCF) and lowest common multiple (LCM) of 48 and 284.
5. Calculate the highest common factor (HCF) and lowest common multiple (LCM) of 192 and 1036.

Unit 1 **Representing Numbers**

1. Calculate the highest common factor (HCF) and lowest common multiple (LCM) of 98, 462 and 483.

**CLASSWIZ WORKSHEETS**

1. Calculate the highest common factor (HCF) and lowest common multiple (LCM) of 270, 735 and 1122.

1. Arrange the following numbers in ascending order: 1.$\dot{1}$,$\frac{11}{9}$ ,$\frac{ 9 }{8}$ ,$\frac{ π }{ 3 }$,$\sqrt{2}$.

1. Arrange the following numbers in ascending order: 6.25, 6.$\dot{4}$, $\frac{619}{99}$ ,$\sqrt{39}$,$\frac{ 94 }{15}$.

1. Arrange the following numbers in ascending order:$\frac{45}{8}$ , 2*π*, $\sqrt{34}$, $\sqrt[3]{200}$, 5.

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**CLASSWIZ WORKSHEETS**

1. Arrange the following numbers in ascending order:$\sqrt[4]{82}$,3.1,$\frac{ 29 }{9}$ , 3.$\dot{1}$, 3$\frac{ 1 }{8}$.

1. Arrange the following numbers in ascending order:$11\frac{ 1 }{ 8 }$ ,$\frac{100}{9}$ , 11.2, $\sqrt{125}$,$\frac{23}{2}$ .
2. A solid cube has sides of length 5 cm. Find the total surface area and volume of the cube.
3. A solid cylinder has a radius of length 4 cm and a height of 10 cm. Find the total surface area and volume of the cylinder.
4. A solid sphere has a radius of 6 cm. Find the total surface area and volume of the sphere.

Unit 1 **Representing Numbers**

1. A solid right pyramid has a square base and a vertical height of 4 cm. The length of a side of the square base is 6 cm. The slant height of a lateral face is given as 5 cm. Find the total surface area and volume of the pyramid.

**CLASSWIZ WORKSHEETS**

1. A solid cone has a circular base with a diameter of 10 cm, height of 12 cm and a slant height of 13 cm. Find the total surface area and volume of the cone.
2. The temperature of Perth at 3 pm and 9 pm on a certain day are 28°C and 16°C respectively. Find the average decrease in temperature per hour.
3. John climbs a mountain. At the level where John started, the temperature was 25°C. When he reached the peak of the mountain, the temperature decreased to –2°C. Find the difference in the temperature.
4. The average temperature increase during the initial phase of baking is 3°C per minute. Given that the initial temperature of the oven is 24°C, calculate how long it will take to reach a temperature of 120°C.

# Level 3

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**CLASSWIZ WORKSHEETS**

1. Ivy bought 1500 apples at $330.
	1. Find the cost price of each apple.
	2. Ivy wanted to sell all the apples at 75 cents each. Calculate the
		1. maximum amount of profit she can make from the sale of all the apples.
		2. profit as a percentage of the total cost price.
	3. Ivy found that 184 apples were rotten and could not be sold. Given that Ivy still wants to earn at least the same amount of profit, calculate the minimum selling price of the apple.
2. Adeline bought a necklace at $699. She made a loss of 28% when she sold it to the pawnshop.
	1. Calculate the price that the pawnshop bought the bracelet for.
	2. The pawnshop later sold the bracelet for a profit of 17%. Calculate the selling price of the bracelet.
3. Salon X and Salon Y each has a bundle promotion on its ‘haircut and colour’ services. Salon X charges this bundle promotion at $150 excluding GST of 11%, while Salon Y charges the bundle promotion at

$170 inclusive of GST. Determine, with calculation, which salon has a cheaper deal.

Unit 1 **Representing Numbers**

1. In a restaurant, a 5% GST will first be charged on the food items, followed by a service tip of any amount. Faith paid a total bill of $100. Given that the food items cost $79,

**CLASSWIZ WORKSHEETS**

* 1. calculate the amount of service tips given.
	2. express the amount of tips as a percentage of the total bill.
1. The solid in the diagram is made up of a right pyramid with a square base and a cuboid. The right pyramid has a vertical height of 7 cm and a square base of 25 cm2 and the cuboid has a height of 10 cm.

7 cm

10 cm

* 1. Find the length of a side of the square base.
	2. Calculate the volume of the solid.
	3. Calculate the slant height of the lateral face of the pyramid, leaving your answer in the exact form.
	4. Hence, calculate the total surface area of the solid.

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**CLASSWIZ WORKSHEETS**

1. The diagram shows a trophy with a rectangular block and a star shaped prism. The star shaped base has an area of 37 cm2 and the length of the side of the star shape is 3 cm. The height of the star shaped prism is 15 cm. The dimensions of the rectangular block is given by 10 cm by 10 cm by 3 cm.

3 cm

15 cm

10

3 cm

cm

10 cm

* 1. The star shaped prism is made of metal and the rectangular block is made of wood. Calculate the volume of metal and wood needed respectively.
	2. The exposed surface of the star shaped prism is coated with a gold paint. Calculate the total surface area of the star shaped prism that needs to be coated with gold paint.
	3. Given that 45 cm2 of gold paint costs $0.25, calculate the cost of coating 1 such trophy.
1. Wesley deposited $18 000 with a bank at the start of the year. The bank offers a simple interest of 3.8%.
	1. Calculate the amount of interest he would receive at the end of 5 years.
	2. Find the least number of years Wesley would need to keep his money in the bank account if he wants to earn an interest of $5000.

Unit 1 **Representing Numbers**

1. Benjamin deposited $*x* with a bank which offers a compound interest of 6%, compounded quarterly for 5 years. Given that Benjamin wants to earn an interest of at least $8000, calculate the minimum amount of money, to the nearest 100, that he needs to keep in the bank.

**CLASSWIZ WORKSHEETS**

1. Ben has 180 strawberries, 75 apples and 30 mangoes. He packs the 3 fruits equally into packets such that there are no leftover fruits.
	1. Find the maximum number of packets that Ben can pack.
	2. State the number of strawberries, apples and mangoes in each packet.
2. Light A lights up once every 80 seconds and Light B lights up once every 36 seconds. Given that they lit up together at 9 pm, calculate the next timing that they will light up together.

# Level 4

**Casio ClassWiz Mathematics Workbook**

**CLASSWIZ WORKSHEETS**

1. In May, the selling price of a TV set was $2850 and 287 sets were sold.
	1. Given that the total profit from the sale of the all the TV sets was $261 744, find the percentage profit of the selling price.
	2. In June, the selling price of the same TV set was increased by 15% and the number of TV sets sold in the month reduced by *x* sets. Given that the profit in June is more than the amount of profit in May, calculate the maximum value of *x*.
2. Bank A offers a 3% interest compounded monthly and Bank B offers a 4% simple interest. Given that Jinny wants to save $25 000 for 10 years, calculate
	1. which Bank will give Jinny a better yield,
	2. the minimum interest rate that Bank A needs to offer to give a better yield than Bank B, giving your answer to the nearest 1 decimal place.

Unit 1 **Representing Numbers**

1. A group of children shares 175 sweets equally, and there were 7 leftover sweets. The group of children then shared another 308 sweets together with the leftover sweets equally and there were no remainder. Find the largest number of children in the group.

**CLASSWIZ WORKSHEETS**

1. The diagram shows a solid hemisphere with a cone removed from it. The hemisphere has a radius of 20 cm and the cone has a diameter of 15 cm, and a height of 10 cm.

20 cm

15 cm

10 cm

Leaving your answer in terms of *π* where necessary,

* 1. calculate the volume of the solid,
	2. calculate the slant height of the cone by using Pythagoras’Theorem,
	3. hence calculate the surface area of the solid.

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**CLASSWIZ WORKSHEETS**

1. The diagram shows a menu from an Italian restaurant.

*Menu*

Sparkling $8 Water (bottle)

Moscato

$12/glass

$80/bottle

Ice-cream $3/scoop

Cheesecake $7.80

|  |  |
| --- | --- |
| Seafood Risotto | $28 |
| Prawn Pasta | $22 |
| Mushroom Pizza | $18 |

Laura and her 8 friends dined at the restaurant and ordered 3 seafood risotto, 2 prawn pasta and 2 mushroom pizzas for their main dish. Next, they ordered 2 bottles of sparkling water and bottle of Moscato for their drinks. For the dessert, 5 of them ordered 3 scoops of ice cream each and 3 ordered cheesecake. Given that there is a 12% service charge followed by a 5% GST,

* 1. calculate the total bill.

As it was Laura’s birthday, her friends treated her to the meal and split the bill equally among themselves.

* 1. Calculate the amount each friend had to pay.