JAWAPAN

BAB 2 Bentuk Piawai
Standard Form

1. (a) Ukuran panjang rod itu ialah 23.5 cm.
The measurement of the rod is 23.5 cm.

(b) Tulis semula bacaan anda di (a) dan bulatkan digit yang tidak pasti.
Rewrite your reading in (a) and circle the digit that is uncertain.
23.(5)

(c) Kejituan pengukuran panjang itu ialah 3 angka bererti.
The precision of the measurement is 3 *significant figures.*

(d) Angka bererti satu nombor ialah digit-digit yang menunjukkan tahap kejituan tertentu.
Significant figures of a number are the digits *that express a specified degree of* accuracy.

2. (a) 1 129
4 angka bererti
4 *significant figures*

(b) 72.4
3 angka bererti
3 *significant figures*

(c) 27.86
4 angka bererti
4 *significant figures*

(d) 402
3 angka bererti
3 *significant figures*

(e) 3 006
4 angka bererti
4 *significant figures*

(f) 20 004
5 angka bererti
5 *significant figures*

(g) 5 107
4 angka bererti
4 *significant figures*

(h) 300
1 angka bererti
1 *significant figure*

(i) 50
1 angka bererti
1 *significant figure*

(j) 7 200
2 angka bererti
2 *significant figures*

(k) 112 240
5 angka bererti
5 *significant figures*

(l) 0.007
1 angka bererti
1 *significant figure*

(m) 0.0302
3 angka bererti
3 *significant figures*

(n) 0.00083
2 angka bererti
2 *significant figures*

(o) 0.00516
3 angka bererti
3 *significant figures*

(p) 1.00
3 angka bererti
3 *significant figures*

(q) 23.000
5 angka bererti
5 *significant figures*

(r) 0.60
2 angka bererti
2 *significant figures*

(s) 7.1400
5 angka bererti
5 *significant figures*

3.

Angka bererti (a.b.)
Significant figures (s.f.)

1 a.b. 1 *s.f.*	2 a.b. 2 *s.f.*	3 a.b. 3 *s.f.*	4 a.b. 4 *s.f.*	5 a.b. 5 *s.f.*
200	0.0017	0.00670	56.33	33.300
0.1	380	1.08	3 007	56.012
6 000	4.0	5 090	80.00	22 506
0.04	0.012	0.210	9.045	540.09

4.

	Ukuran *Measurement*	1 a. b. 1 *s. f.*	2 a.b. 2 *s.f.*	3 a.b. 3 *s.f.*	4 a.b. 4 *s.f.*
(a)	11 564	10 000	12 000	11 600	11 560
(b)	22 099	20 000	22 000	22 100	22 100
(c)	30 783	30 000	31 000	30 800	30 780
(d)	198 232	200 000	200 000	198 000	198 200
(e)	0.0032181	0.003	0.0032	0.00322	0.003218
(f)	198.73	200	200	199	198.7
(g)	4.0032	4	4.0	4.00	4.003
(h)	0.12005	0.1	0.12	0.120	0.1201

5. (a) 30 (b) 20
(c) 32.9 (d) 70 020
(e) 0.070 (f) 0.002
(g) 6.0 (h) 20 000
(i) 572 (j) 198 000
(k) 200 000 (l) 7.235
(m) 850 900 (n) 3.5
(o) 51.75

6. (a) $81 \div 2.4 + 12.4$ [1]
$= 33.75 + 12.4$
$= 46.15$
$= 50$

(b) $8.16 + 19.4 - 9.19$ [3]
$= 27.56 - 9.19$
$= 18.37$
$= 18.4$

(c) $32.41 \times 2.23 + 77.1 \div 5$ [4]
$= 72.2743 + 15.42$
$= 87.6943$
$= 87.69$

(d) $51.03 - 3.13 \times 6.7 + 6.6$ [2]
$= 51.03 - 20.971 + 6.6$
$= 36.659$
$= 37$

7. (a) 2.1×10^4 ✓

(b) 0.63×10^{-3} ✗

(c) 25×10^7 ✗

(d) 9×10^{-2} ✓

(e) 0.08×10 ✗

(f) $3.4 \times 10^{1.5}$ ✗

(g) 1.33×10^{100} ✓

(h) $7 \times 10^{\frac{1}{2}}$ ✗

(i) 1.0×10^{-10} ✓

8. (a) 23 000
$= 2.3 \times 10\,000$
$= 2.3 \times 10^4$

(b) 5 623
$= 5.623 \times 1\,000$
$= 5.623 \times 10^3$

(c) 781 900
$= 7.819 \times 100\,000$
$= 7.819 \times 10^5$

(d) 1 400 000
$= 1.4 \times 1\,000\,000$
$= 1.4 \times 10^6$

(e) 0.0042
$= 4.2 \times 0.001$
$= 4.2 \times 10^{-3}$

(f) 0.01873
$= 1.873 \times 0.01$
$= 1.873 \times 10^{-2}$

(g) 0.0000338
$= 3.38 \times 0.00001$
$= 3.38 \times 10^{-5}$

(h) 0.00052
$= 5.2 \times 0.0001$
$= 5.2 \times 10^{-4}$

9. (a) 8×10^5
$= 8 \times 100\,000$
$= 800\,000$

(b) 9.3×10^6
$= 9.3 \times 1\,000\,000$
$= 9\,300\,000$

(c) 1.82×10^7
$= 1.82 \times 10\,000\,000$
$= 18\,200\,000$

(d) 7.265×10^8
$= 7.265 \times 100\,000\,000$
$= 726\,500\,000$

(e) 3×10^{-2}
$= 3 \times 0.01$
$= 0.03$

(f) 2.7×10^{-4}
$= 2.7 \times 0.0001$
$= 0.00027$

(g) 3.023×10^{-5}
$= 3.023 \times 0.00001$
$= 0.00003023$

(h) 5.36×10^{-6}
$= 5.36 \times 0.000001$
$= 0.00000536$

10. (a) 1 megajoule = 1×10^{6} joule

(b) 1 miliampere = 1×10^{-3} ampere
1 *milliampere* *ampere*

(c) 1 kilowatt = 1×10^{3} watt

(d) 1 nanogram = 1×10^{-9} gram

(e) 1 sentimeter = 1×10^{-2} meter
1 *centimetre* *metre*

(f) 1 terabait = 1×10^{12} bait
1 *terabyte* *byte*

(g) 1 mikrometer = 1×10^{-6} meter
1 *micrometre* *metre*

(h) 1 gigabait = 1×10^{9} bait
1 *gigabyte* *byte*

(i) 1 pikometer = 1×10^{-12} meter
1 *picometre* *metre*

(j) 1 femtometer = 1×10^{-15} meter
1 *femtometre* *metre*

11. (a) 2 310 gigabait [bait]
2 310 *gigabytes [byte]*
$= 2.31 \times 10^{3} \times 10^{9}$
$= 2.31 \times 10^{3+9}$
$= 2.31 \times 10^{12}$ bait/ *bytes*

(b) 323 milimeter [meter]
323 *millimetres [metre]*
$= 3.23 \times 10^{2} \times 10^{-3}$
$= 3.23 \times 10^{2+(-3)}$
$= 3.23 \times 10^{-1}$ meter/ *metre*

(c) 0.045 desimeter [meter]
0.045 *decimetre [metre]*
$= 4.5 \times 10^{-2} \times 10^{-1}$
$= 4.5 \times 10^{-2+(-1)}$
$= 4.5 \times 10^{-3}$ meter/ *metre*

(d) 0.543 petaliter [liter]
0.543 *petalitre [litre]*
$= 5.43 \times 10^{-1} \times 10^{15}$
$= 5.43 \times 10^{-1+15}$
$= 5.43 \times 10^{14}$ liter/ *litre*

12. (a) $3.4 \times 10^{4} + 6.1 \times 10^{4}$
$= (3.4 + 6.1) \times 10^{4}$
$= 9.5 \times 10^{4}$

(b) $8.9 \times 10^{3} - 1.2 \times 10^{3}$
$= (8.9 - 1.2) \times 10^{3}$
$= 7.7 \times 10^{3}$

(c) $1.98 \times 10^{-5} - 1.08 \times 10^{-5}$
$= (1.98 - 1.08) \times 10^{-5}$
$= 0.9 \times 10^{-5}$ ← $9 \times 10^{-1} \times 10^{-5}$
$= 9 \times 10^{-6}$

(d) $9.3 \times 10^{-5} + 2.13 \times 10^{-4}$
$= 0.93 \times 10^{-4} + 2.13 \times 10^{-4}$
$= (0.93 + 2.13) \times 10^{-4}$
$= 3.06 \times 10^{-4}$

(e) $4.05 \times 10^{-7} - 2.2 \times 10^{-8}$
$= 4.05 \times 10^{-7} - 0.22 \times 10^{-7}$
$= (4.05 - 0.22) \times 10^{-7}$
$= 3.83 \times 10^{-7}$

(f) $2.4 \times 10^{7} \times 1.8 \times 10^{-3}$
$= 2.4 \times 1.8 \times 10^{7+(-3)}$
$= 4.32 \times 10^{4}$

(g) $7\,200\,000 \times 1.5 \times 10^{-4}$
$= 7.2 \times 10^{6} \times 1.5 \times 10^{-4}$
$= 7.2 \times 1.5 \times 10^{6+(-4)}$
$= 10.8 \times 10^{2}$ ← $1.08 \times 10 \times 10^{2}$
$= 1.08 \times 10^{3}$

(h) $1.2 \times 10^{5} \div (6 \times 10^{5})$
$= \frac{1.2}{6} \times 10^{5-5}$
$= 0.2 \times 10^{0}$ ← $10^{0} = 1$
$= 2 \times 10^{-1}$

(i) $7.9 \times 10^{2} \times 2.1 \times 10^{-4}$
$= 7.9 \times 2.1 \times 10^{2+(-4)}$
$= 16.59 \times 10^{-2}$
$= 1.659 \times 10 \times 10^{-2}$
$= 1.659 \times 10^{-1}$

(j) $\frac{1.8 \times 10^{-9}}{5 \times 10^{8}}$
$= \frac{1.8}{5} \times \frac{10^{-9}}{10^{8}}$
$= 0.36 \times 10^{-9-8}$
$= 3.6 \times 10^{-1} \times 10^{-17}$
$= 3.6 \times 10^{-18}$

(k) $\dfrac{4\,800}{2.5 \times 10^6}$

$= \dfrac{4.8 \times 10^3}{2.5 \times 10^6}$

$= \dfrac{4.8}{2.5} \times 10^{3-6}$

$= 1.92 \times 10^{-3}$

(l) $\dfrac{6.3 \times 10^{-5}}{12\,000}$

$= \dfrac{6.3 \times 10^{-5}}{1.2 \times 10^4}$

$= \dfrac{6.3}{1.2} \times 10^{-5-4}$

$= 5.25 \times 10^{-9}$

13. (a) (i) Ketebalan sehelai kertas dalam mm
Thickness of a sheet of paper in mm

$= 55 \div 800$

$= 0.06875$

$= 6.875 \times 10^{-2}$ mm

(ii) Ketebalan sehelai kertas dalam cm
Thickness of a sheet of paper in cm

$= 6.875 \times 10^{-2} \times 10^{-1}$

$= 6.875 \times 10^{-2+(-1)}$

$= 6.875 \times 10^{-3}$ cm

(b) (i) 1 jam = 60 minit
1 *hour* = 60 *minutes*

Bilangan mainan yang dapat dihasilkan dalam 1 jam
The number of toys produced in 1 *hour*

$= 55 \times 60$

$= 3\,300$

$= 3.3 \times 10^3$

(ii) Bilangan mainan yang dapat dihasilkan dalam 20 hari
The number of toys produced in 20 *days*

$= 3.3 \times 10^3 \times 8 \times 20$

$= 3.3 \times 10^3 \times 1.6 \times 10^2$

$= 5.28 \times 10^{3+2}$

$= 5.28 \times 10^5$

(c) 3 hari $= 3 \times 24 \times 60$

3 *days* $= 4\,320$

$= 4.32 \times 10^3$ minit

4.32×10^3 *minutes*

Jarak yang dilalui dalam masa seminit
Distance travelled in a minute

$= \dfrac{3.84 \times 10^5}{4.32 \times 10^3}$

$= \dfrac{3.84}{4.32} \times 10^{5-3}$

$= 0.889 \times 10^2$

$= 8.89 \times 10^{-1} \times 10^2$

$= 8.89 \times 10$ km

(d) Jarak = Laju × Masa
Distance = *Speed* × *Time*

$= 100 \times 717 \times 365 \times 24$

$= 628\,092\,000$

$= 6.28 \times 10^8$ km

(e) (i) $2(3.2 \times 10^6) + 2(5 \times 10^5)$

$= 6.4 \times 10^6 + 10 \times 10^5$

$= 6.4 \times 10^6 + 1 \times 10^{1+5}$

$= 6.4 \times 10^6 + 1 \times 10^6$

$= (6.4 + 1) \times 10^6$

$= 7.4 \times 10^6$ m

(ii) $3.2 \times 10^6 \times 5 \times 10^5$

$= 3.2 \times 5 \times 10^6 \times 10^5$

$= 16 \times 10^{6+5}$

$= 16 \times 10^{11}$

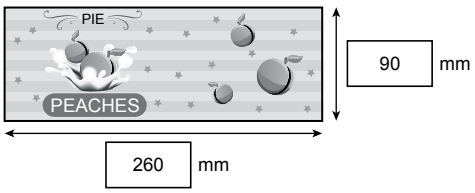
$= 1.6 \times 10 \times 10^{11}$

$= 1.6 \times 10^{1+11}$

$= 1.6 \times 10^{12}$ m^2

$2 \times 3.142 \times 40$
$= 251.36$ mm

(f)



(i) Luas permukaan/ *Surface area*

$= 2\pi j^2 + 2\pi jt$ $(2\pi r^2 + 2\pi rh)$

$= 2 \times 3.142 \times 40^2 + 2 \times 3.142 \times 40 \times 90$

$= 10\,054.4 + 22\,622.4$

$= 32\,676.8$

$= 3.268 \times 10^4$ mm^2

(ii) Mana-mana jawapan lain yang sesuai
Any other possible answers

(g) (i) Diameter bakteria jenis *B*
Diameter of bacteria species B

$= 1 \times 10^{-6} \times 1 \times 10^{-3}$

$= 1 \times 10^{-6+(-3)}$

$= 1 \times 10^{-9}$ m

(ii) 1×10^{-9} m = 1 nm
Nilai yang diperoleh itu sama dengan 1 nanometer.
The value obtained is equal to 1 *nanometre.*

Power PT3

Bahagian A

1. Semua sifar selepas digit bukan sifar terakhir dalam suatu nombor perpuluhan ialah angka bererti.
All zeros after the last non-zero digit in a decimal number are significant figures.
Jawapan/ *Answer*: **D**

2. Bilangan angka bererti yang mungkin bagi 3 400 ialah 2, 3 dan 4.
The possible number of significant figures for the number 3 400 *are* 2, 3 *and* 4.
Jawapan/ *Answer*: **A**

3. 52 542 → 52 540 (4 a.b. / 4 s.f.)
34 780 → 34 800 (3 a.b. / 3 s.f.)
20 004 → 20 000 (1 a.b. / 1 s.f.)
17 513 → 20 000 (1 a.b. / 1 s.f.)
Jawapan/ *Answer*: **C**

4. 6 lebih besar daripada 5, maka tambah 1 kepada digit 4 dan gantikan digit 6 dengan 0.
6 *is larger than* 5, *then add* 1 *to digit* 4 *and replace digit* 6 *with* 0.

$$0.0746 \rightarrow 0.075 \text{ (2 a.b. / s.f.)}$$

Jawapan/ *Answer*: **B**

5. Bentuk piawai: $a \times 10^n$ dengan keadaan $1 \times A < n$ dan n ialah integer. Indeks bagi 10 dalam $5.662 \times 10^{3.5}$ bukan integer.
Standard form: $a \times 10^n$ *where* $1 \times A < n$ *and n is an integer. The index of* 10 *in* $5.662 \times 10^{3.5}$ *is not an integer.*
Jawapan/ *Answer*: **D**

6. 35 juta / *million* $= 35 \times 1\,000\,000$
$= 3.5 \times 10^7$
Jawapan/ *Answer*: **C**

7. $4.7 \times 10^{-4} = 4.7 \times \dfrac{1}{10\,000}$
$= 0.00047$
Jawapan/ *Answer*: **B**

8. $3.1 \times 10^5 - 4.632 \times 10^4 = 263\,680$
$= 264\,000$ (3 a.b. / 3 s.f.)
$= 2.64 \times 10^5$
Jawapan/ *Answer*: **D**

Bahagian B

9. (a) $4 \times 10^6 \times 9 \times 10^6$
$= \boxed{36} \times 10^{12}$
$= 3.6 \times 10^{\boxed{13}}$

(b) | (1) | (2) | 3 | 4 |

10.

	Awalan *Prefix*	Nilai *Value*	✓ / ✗
(a)	femto	1×10^{-15}	✓
(b)	atto	1×10^{-18}	✓
(c)	mega	1×10^{9}	✗
(d)	tera	1×10^{12}	✓

11. (a)

3 850 megabait *megabytes*	,	0.025 terabait *terabytes*	,	36 gigabait *gigabytes*

0.025 terabait / *terabyte*
$= 0.025 \times 10^{12}$ bait / *bytes*
$= 2.5 \times 10^{10}$ bait / *bytes*

36 gigabait / *gigabytes*
$= 36 \times 10^9$ bait / *bytes*
$= 3.6 \times 10^{10}$ bait / *bytes*

3 850 megabait / *megabytes*
$= 3\,850 \times 10^6$ bait / *bytes*
$= 3.85 \times 10^9$ bait / *bytes*

(b) 36 gigabait / *gigabytes*
$= 3.6 \times 10^{10}$ bait / *bytes*
$= 4 \times 10^{10}$ bait / *bytes* (1 a.b. / 1 s.f.)

Bahagian C

3. (a) $\boxed{2 \times 10^{-8}}$ meter, $\boxed{4 \times 10^{-7}}$ meter

$20 \text{ nm} = 20 \times 10^{-9} \text{ m} = 2 \times 10^{-8} \text{ m}$
$400 \text{ nm} = 400 \times 10^{-9} \text{ m} = 4 \times 10^{-7} \text{ m}$

(b) (i) $3.42 \times 10^4 + 4.5 \times 10^3$
$= 3.42 \times 10^4 + 0.45 \times 10^4$
$= (3.42 + 0.45) \times 10^4$
$= 3.87 \times 10^4$

(ii) $\dfrac{2.5 \times 10^7}{4 \times 10^3}$
$= \dfrac{2.5}{4} \times \dfrac{10^7}{10^3}$
$= 0.625 \times 10^{7-3}$
$= 0.625 \times 10^4$
$= 6.25 \times 10^3$

(c) Pelan *A* / *Plan A*

$\dfrac{8 \text{ GB}}{\text{RM32}} = \dfrac{8 \times 10^9}{\text{RM32}}$
$= 2.5 \times 10^8$ bait / RM1

Pelan *B* / *Plan B*

$\dfrac{600 \text{ MB}}{\text{RM8}} = \dfrac{600 \times 10^6 \text{ bait}}{\text{RM8}}$
$= 7.5 \times 10^7$ bait / RM1

Oleh sebab data internet pelan A bagi setiap RM1 adalah lebih tinggi, maka pelan A adalah lebih murah.
Since the internet data of plan A for every RM1 *is higher, plan A is cheaper.*

Power KBAT

1.

Tilam/ *Mattress* RM255.86	✓	✓	
Sofa/ *Sofa* RM225.99	✓		✓
Rak buku/ *Bookshelf* RM297.68		✓	✓
Jumlah harga (RM) *Total price* (RM)	481.85	553.54	523.67

Tidak cukup wang
Not enough money

Menerima baki paling rendah: Sofa dan rak buku
Receive the lowest balance: Sofa and bookshelf

Jumlah harga = RM523.67 = RM524 (3 a.b. / 3 *s.f.*)
Total price

2. 1 $\text{cm}^2 = 100 \text{ mm}^2$

Jisim bagi 1 mm^2 kertas graf
Mass of 1 mm^2 *of graph paper*
$= (322 \text{ g} \div 50) \div (560 \times 100 \text{ mm}^2)$
$= \dfrac{6.44 \text{ g}}{56\,000 \text{ mm}^2}$
$= 0.000115$
$= 1.15 \times 10^{-4}$ g