1. (a) 4009 – 4 significant figures
   (b) 7.90 – 3 significant figures
   (c) 0.0046 – 2 significant figures

2. a) $0.54 / 2.07 = 0.2609$

   Answer should be to two significant figures because the least number of s.f is a component is 2.

   Therefore

   $0.54 / 2.07 = 0.26$

   (b) $5.67 - 1.1 - 0.9378 = 3.6322$ (Answer should be to 4 s.f)

3. $\text{Average} = \frac{150.4 + 148.3 + 149.6 + 151.0 + 150.8 + 149.8}{6}$

   $\text{Average} = \frac{899.8}{6} = 149.9667 = 150$

4. $101100 = 1.011 \times 10^5$
5. $0.0102 = 1.02 \times 10^{-2}$
6. $0.00000672 = 6.72 \times 10^{-6}$
7. $9.301 \times 10^7 = 9.301 \times 10\,000\,000$
   $= 93010000$
8. $9.301 \times 10^2 = 9.301 \times 100 = 930.1$
9. $9.301 \times 10^{-5} = 9.301 \times \frac{1}{10^5} = \frac{9.301}{100\,000} = 0.000009301$
10. $g^6 = at^4 / b \Rightarrow at^4 = bg^6$
    $a = \frac{bg^6}{t^4}$
11. $d^2 c \propto b^4 c^3 a^2$
    $d^2 c = b^4 c^3 a \Rightarrow a = \frac{d^2 c}{b^4 c^3}$

12. $d^3a^2 = b^2dc^4$

$$a^2 = \frac{b^2dc^4}{d^3}$$

$$a = \sqrt{\frac{b^2dc^4}{d^3}}$$

13. $(6.125 \times 10^3) \times (2.345 \times 10^4) = 1.436 \times 10^9$ (4 sig for the decimal part)

14. $(6.125 \times 10^3) \times (2.345 \times 10^{-4}) = 1.4366$ (4 sig)

15. $(6.2 \times 10^4) \times (0.4 \times 10^{-5}) = 2 \times 10^{10}$ (1 sig)

17. $23^\circ\ 15'\ 47''$

$60'' \rightarrow 1'$

$47'' \rightarrow ?$

$= \left(\frac{47}{60}\right)' = 0.7833'$

~~$\left(\frac{1}{47} \times 60\right)$~~

$60' \rightarrow 1^\circ$

$15.7833' \rightarrow$ ~~15.7833~~ ?

$15.7833 \times \frac{1}{60} = 0.2631$

$23^\circ\ 15'\ 47'' = 23.2631^\circ$

18. 1 ft → 12 inches

1 mile = 5280 feet.

50000 inches in feet $= \frac{50000}{12} = 4166.667$ ft

4166.667 ft to miles $= 4166.667 \div 5280 = 0.7891$ miles

19. A day on earth is equal to $\frac{24}{10^{4/5}}$ days on saturn

$$\frac{24}{10^{4/5}} = 2.33766$$

34 earth days are equal to 34×2.33766 saturn days

$= 79.48$ days ≈ 80 days

20. 2.3 km/s

This speed in m/s = $\frac{2.3 \times 1000}{s}$ = 2,300 m/s

2.5 mins = 2.5 × 60 = 150 s

distance = velocity * time = 2300 m/s × 150 s =

= 345000 m = 345 km

21. 1 AU = 1.496×10^{11} m

d = 0.90 AU = 0.90 × 1.496×10^{11}

= 1.3464×10^{11} m

a = 3.25 AU = $3.25 \times 10^{11} \times 1.496$ = 4.862×10^{11} m

$d = a(1 - e)$

$d = a - ae$

$ae = a - d$

$e = \frac{a-d}{a} = \frac{3.25 - 0.90}{3.25}$ = 0.723 AU

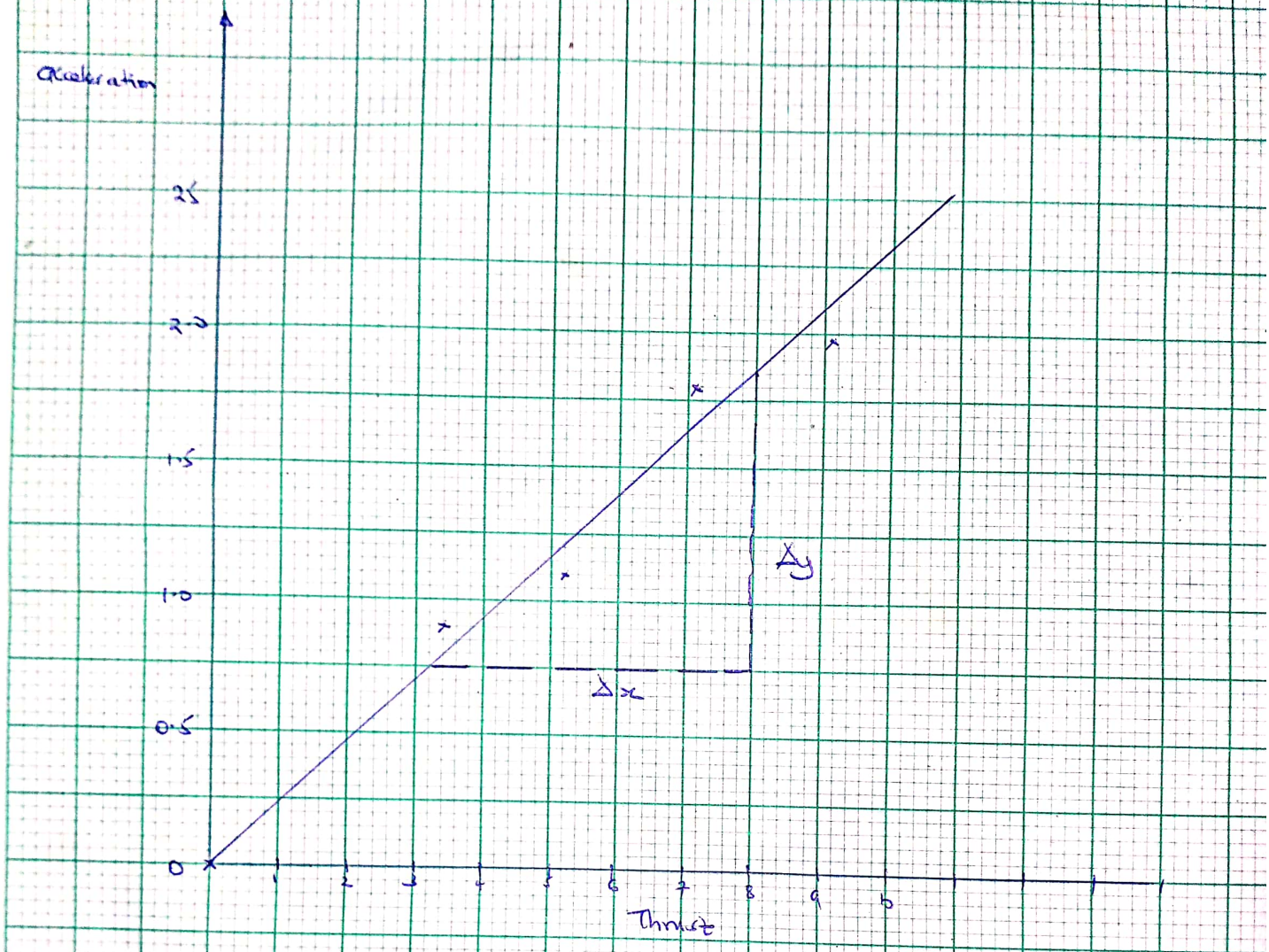
22. debt per person = $\frac{13.6 \times 10^9}{281 \times 10^6}$ = $\frac{13600\,000\,000}{281\,000\,000}$ = 48.40 dollars

23. 1.15 inches = 3.21 AU

1.85 inches ⇒ ?

$\frac{1.85 \times 3.21}{1.15}$ = 8.38 AU

(24)



$$\text{slope} = \frac{\Delta y}{\Delta x} = \frac{1.8 - 0.75}{8 - 3.2} = \frac{1.05}{4.8} = 0.22$$

25. From the graph,

period = 10 days

size of orbit = 4 AU