4th Revision 2

1. A sequence is defined $u_{n+1} = \dfrac{2}{3u_n} + 1$ and $u_1 = 3$. Find u_2, u_3. $\boxed{\frac{11}{9}, \frac{17}{11}}$

2. In the following make x the subject

   (a) $\sqrt{x^2 + a^2} = 2c$. $\boxed{x = \sqrt{4c^2 - a^2}}$

   (b) $ax + b = cx + d$. $\boxed{x = \frac{d-b}{a-c} = \frac{b-d}{c-a}}$

   (c) $\frac{x-1}{x+c} = d$. $\boxed{x = \frac{dc+1}{1-d}}$

   (d) $\sqrt{\frac{2x+a}{x-b}} = k$. $\boxed{x = \frac{a+bk^2}{k^2-2}}$

3. Find the equation of the line that passes through $(4, -1)$ and $(2, 3)$ in the form $y = mx + c$. $\boxed{y = -2x + 7}$

4. A triangle PQR has lengths $PQ = PR = 8$ and $QR = 5$. Find $Q\hat{P}R$. $\boxed{36.42^\circ}$

5. Factorise

   (a) $16ax^2 - 10ax$. $\boxed{2ax(8x - 5)}$

   (b) $2x^3y - 8x^2y - 10xy$. $\boxed{2xy(x + 1)(x - 5)}$

   (c) $48x^3y^2 - 147xy^2$. $\boxed{3xy^2(4x - 7)(4x + 7)}$

6. Find the equation of the line that passes through $(2, -1)$ and $(7, \frac{1}{2})$ in the form $ax + by + c = 0$. $\boxed{0 = 3x - 10y - 16}$

7. Solve

   (a) $\frac{8}{2x-1} = 7$. $\boxed{x = \frac{15}{14}}$

   (b) $\frac{2x-3}{4} - \frac{2x-1}{3} = 3x - \frac{3-x}{2}$. $\boxed{x = \frac{13}{44}}$

   (c) $x^2 = 16$. $\boxed{x = 4 \text{ or } x = -4}$

   (d) $x^2 = 16x$. $\boxed{x = 0 \text{ or } x = 16}$

   (e) $x^2 = 16x - 15$. $\boxed{x = 1 \text{ or } x = 15}$

   (f) $1000\pi x^2 + 2000\pi x = 8000\pi$. $\boxed{x = 2 \text{ or } x = -4}$

8. Find the 700th term of the sequence $-8, -11, -14, -17, -20, \ldots$. $\boxed{-2105}$

9. Find the equation of the line perpendicular to the line $3x - 2y + 8 = 0$ that passes through the point $(-1, 2)$. $\boxed{2x + 3y - 4 = 0}$

10. Triangle ABC is similar to XYZ.

    (a) Given that $AB = 3$, $AC = 5$ and $XY = 13$, find XZ. $\boxed{65/3}$

    (b) If the area of triangle ABC is 4cm^2 find the area of triangle XYZ. $\boxed{\frac{676}{9}}$

11. The point $(-3, 1)$ is rotated 90° clockwise about the point $(-2, -1)$. Find the image point. $\boxed{(0, 0)}$

12. Sketch the curve $y = x^2 + 2x - 15$, giving the three coordinates where the curve crosses the axes and the vertex. $\boxed{(0, -15), (-5, 0), (3, 0), (-1, -16)}$

13. Two childrens toys are mathematically similar. The sticker on the smaller one has area 30cm^2. The sticker on the larger on is 187.5cm^2. If the volume of the smaller one is 140cm^3, find the volume of the larger one. $\boxed{2187.5}$

14. Solve $\begin{matrix} x + 2y = 5 \\ 2x^2 - y^2 = -2 \end{matrix}$. $\boxed{(1, 2) \text{ or } (-\frac{17}{7}, \frac{26}{7})}$