2. Coordinates and graphics

1.	(i) $$k\left(\frac{3-7}{2}, \frac{4+2}{2}\right) = (-2,3)$$ $$p\left(\frac{3+1}{2}, \frac{4-2}{2}\right) = (2,1)$$	B_1 for both p and k ✓
	(ii) $$G_1 = \frac{3-2}{-2-2} = \frac{-1}{2}$$ $$G_2 = 2$$ Mid $p + kp = \left(\frac{-2+2}{2}, \frac{3+1}{2}\right) = (0,2)$ $\therefore$ equation $\quad y = 2x + c$ when $\quad x = 0, y = 2, then \quad c = 2$ hence , $\quad y = 2x + 2$	B_1 for both G_1 and G_2 ✓ r identified $\frac{B_1}{3}$

2. Let the exterior $\angle$ be x

$6.5x + x = 180$

$7.5x = 180^0$

$x = 24$

No. of sides = $\frac{360}{24}$

$= 15$ sides.

3. $\dfrac{(2n-4)\,90}{(2(n+2)-4)90} = \dfrac{3}{4}$

$\dfrac{2n-4}{2n} = \dfrac{3}{4}$

$8n - 16 = 6n$

$2n = 16$

$n = 8$

$(2(8) - 4)\,90$

$= 12 \times 90 = 1080$

4. $\dfrac{15}{2}\dfrac{b}{2} = 60$
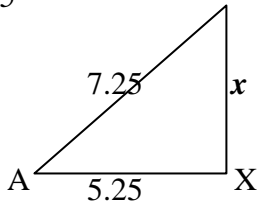
$15b = 60 \times 4$

$b = 16cm$ (diagonal)

$\quad\Rightarrow\quad = \sqrt{8^2 + 7.5^2}$

$\therefore per = 4 \sqrt{8^2 + 7.5^2}$

$= 43.86cm$

5. $x^2 = 7.25^2 - 5.25^2$

B

$$x = \sqrt{7.25^2 - 5.25^2}$$
$$= 52.5625$$
$$\underline{27.5625} \quad -$$
$$\sqrt{25}$$
$$= 5cm$$

$$BC = 15.25 + 5 = 22.25cm$$
$$Arc\ CD = {}^{90}/_{360} \times 3.142 \times 2 \times 22.25$$
$$= 34.65475$$
$$Perimeter = AB + BC + CD + DE + EA$$
$$= 15.25 + 7.25 + 22.25 + 34.95 + 5.25$$
$$= 84.95cm$$

6. $AB^2 = 10^2 - 8^2 = 100 - 64$ ***Attempt to get x by using*** $i+e = 180^o$
         $AB^2 = 36$ $e = \dfrac{(2n\text{-}4)90}{n}$
         $AB = 6cm$
         $Cos\ (90^o - x^{o)\ 8}/_{10} = {}^4/_5$ ***number of sides***

7. $x - 20 + 3x = 180^o C$
         $4x = 200$
          $x = 50^o$

8. $2x + 40 + x - 25$
         $3x + 15 + 9 = 180$
         $3x + 15 = 29$
         $9 = \frac{1}{2}(3x + 15)$
         $3x + \dfrac{3x}{2} = 180 - 15 - \dfrac{15}{2}$
         $x = 35^o$
         $x = 35 = 10^o$
         $\frac{1}{2}(10 + 110) = 60^o$

9. $\dfrac{1260}{90} = 14rt\ \angle s$
         $Sum\ of\ interior\ \angle s$
         $(2n - 4)\ rt\ \angle s$
         $2n - 4 = 14$
           $n = 9$ $9\ sided\ polygon$

10. $N = 50 + 40 = 90^o$
         Alternative angles

11. $5^{3(y+1)} + 5^{3y} = 630$
         $Let\ x = 5^{3y}$
         $5^3 \times 5^{3y} + 5^{3y} = 630$
         $125x + x = 630$
         $x = 5$
         $5^{3y} = 5^1$
         $3y = 1$
         $y = {}^1/_3$

12. $\underline{360} + 108 = 180 - \underline{360}$

$$n \qquad\qquad n$$
$$360 + 108n = 180n - 360$$
$$-72n = -720$$
$$n = 10$$

13. *Let exterior angle be x*

$$\frac{4x}{4} = \frac{180^o}{4}$$

$$x = 45^o$$

n=360

Exterior angle

$$n = \frac{360}{45}$$

$$= 8 sides$$

14. a) *Let $< BDC = \phi$*

$$A^2 = 5^2 + 8^2 - 2 \times 5 \times 8 \cos \phi$$

$$\cos \phi = \frac{89 - 16}{80} = \frac{73}{80} \qquad = 0.9125$$

$$\phi = 24\overset{1}{\cdot}9 \qquad\qquad {}_1 \; {}^= 24^{\circ}8$$

   b) *Area of ABD*

$$= \tfrac{1}{2} \times 8 \times 10 \sin 24\cdot9^{1}$$

$$= 40 \times 0.4091$$

$$= 16.36 cm^3 \qquad\qquad 16.37 \qquad\qquad 16.38$$

15. (a) $\angle CDF = 100-60 = 40^o$ *(exterior angle of a Δ)*
    (b) $\angle BDE = 20^o$ *(DE is bisector of BDG)*
          $\therefore \angle ABD = 20^o$ *(alternate angles)*

16. $4x + x - 30 = 180$
    $5x = 210^{\circ}$
    $x = 42$
    $(x - 30)n = 360^{\circ}$
    $12n = 360^{\circ}$
      $n = \dfrac{360^{\circ}}{12}$
       $n = 30$

17. $180(n-20) = 1440$
    $n - 2 = \dfrac{1440}{180} = 8$
    $n = 10$
    Decagon

18. $<PQR = <SRT = x$ *(Alt $<SPQ$ //RS)*
    $\therefore 5x + 3x + x = 180^{\circ} <$'s of Δ
        $9x = 180^{\circ}$
         $X = 20^{\circ}$
          $\therefore 5 \times 20 + y = 180$
           $y = 180 - 120 = 60$

19. *Let the interior $\angle$ be x and exterior be y*

$\therefore x + y = 180$

   +

$\underline{x - y = 132}$

$2x \quad = 312$

$x = 156$

$y = 180 - 156 = 24^o$

No. of sides (n) $= \dfrac{360^o}{24} = 15$

       $= 15 \text{ sides}$