

Sec 4 Algebra (Week 5)

Date:

No.

$$\begin{aligned}
 1a) \quad & 3a^2 - 27a^2b + 3a^2c - 27abc \\
 &= 3a^2(1 - 9b) + 3a(ac - 9bc) \\
 &= 3a(a - 9ab) + 3a(ac - 9bc) \\
 &= 3a(a - 9ab + ac - 9bc) \\
 &= 3a[(a - 9ab) + c(a - 9b)] \\
 &= 3a(c+1)(a-9b)
 \end{aligned}$$

$$\begin{aligned}
 1b) \quad & 63 - 7w^2 \\
 &= 7(9 - w^2) \\
 &= 7(3-w)(3+w)
 \end{aligned}$$

$$\begin{aligned}
 2a) \quad & \frac{3}{p} - \frac{p}{1+p} = \frac{5}{2} \\
 & \frac{3(1+p) - p^2}{p(1+p)} = \frac{5}{2} \\
 & \frac{3+3p-p^2}{p+p^2} = \frac{5}{2} \\
 & 6+6p-2p^2 = 5p+5p^2 \\
 & -7p^2+p+6=0 \\
 & (7p+6)(-p+1)=0 \\
 & \therefore p = -\frac{6}{7} \text{ or } p = 1
 \end{aligned}$$

$$\begin{aligned}
 2b) \quad & \frac{4k-3k^2}{6k^2+k-12} \\
 &= \frac{k(4-3k)}{(2k+3)(3k-4)} \\
 &= \frac{k(4-3k)}{-(2k+3)(4-3k)} \\
 &= -\frac{k}{2k+3}
 \end{aligned}$$

$$\begin{aligned}
 2c) \quad & 4mn = p - 3qn \\
 & mn + 3qn = p - 1 \\
 & n(m+3q) = p-1 \\
 & n = \frac{p-1}{m+3q}
 \end{aligned}$$

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Gen

$$3a) \frac{1}{3}(x-4) + \frac{1}{4}(x-5) = \frac{1}{7}(x-9)$$

$$\frac{1}{3}x - \frac{4}{3} + \frac{1}{4}x - \frac{5}{4} = \frac{1}{7}x - \frac{9}{7}$$

$$\frac{1}{3}x + \frac{1}{4}x - \frac{1}{7}x = -\frac{9}{7} + \frac{5}{4} + \frac{4}{3}$$

$$\frac{37}{84}x = \frac{25}{84}$$

$$x = \frac{25}{37}$$

$$3b) (2x+1)(x+2) = 5$$

$$2x^2 + 4x + x + 2 = 5$$

$$2x^2 + 5x - 3 = 0$$

$$\begin{matrix} 2 & -1 \\ 1 & -3 \end{matrix}$$

$$(2x-1)(x+3) = 0$$

$$x = \frac{1}{2} \text{ or } x = -3$$

$$4a) xy = \left(t - \frac{1}{t}\right)\left(t + \frac{1}{t}\right)$$

$$= t^2 - \left(\frac{1}{t}\right)^2$$

$$= t^2 - \frac{1}{t^2}$$

$$4b) x^2 + y^2$$

$$= \left(t - \frac{1}{t}\right)^2 + \left(t + \frac{1}{t}\right)^2$$

$$= t^2 - 2 + \frac{1}{t^2} + t^2 + 2 + \frac{1}{t^2}$$

$$= 2t^2 + \frac{2}{t^2}$$

$$4c) x^2 - y^2$$

$$= \left(t - \frac{1}{t}\right)^2 - \left(t + \frac{1}{t}\right)^2$$

$$= t^2 - 2 + \frac{1}{t^2} - t^2 - 2 - \frac{1}{t^2}$$

$$= -4$$

$$\text{Given that } x = \frac{1}{2}$$

$$\therefore \frac{1}{2} = t - \frac{1}{t}$$

$$\frac{3}{2} = \frac{t^2 - 1}{t}$$

$$3t = 2t^2 - 2$$

$$2t^2 - 3t - 2 = 0$$

$$(2t+1)(t-2) = 0$$

$$t = -\frac{1}{2} \text{ or } t = 2$$

$$\text{Sub when } t = -\frac{1}{2}$$

$$y = -\frac{1}{2} + \frac{1}{-\frac{1}{2}}$$

$$= -\frac{1}{2} - 2$$

$$= -2\frac{1}{2}$$

$$\text{When } t = 2$$

$$y = 2 + \frac{1}{2}$$

$$= 2\frac{1}{2}$$

$$5) \quad \frac{1}{u} + \frac{5}{v} = 13$$

$$\frac{2v+5u}{uv} = 13$$

$$2v+5u = 13uv \quad (1)$$

$$\frac{3}{v} - \frac{1}{u} = 10$$

$$\frac{3u-v}{vu} = 10$$

$$3u-v = 10uv$$

$$-v+3u = 10uv \quad (2)$$

$$(2) \quad -v = 10uv - 3u$$

$$v = -10uv + 3u \quad (3)$$

Sub (3) into (1)

$$\therefore 2(-10u$$

$$\frac{2}{u} = 13 - \frac{5}{v}$$

$$\frac{2}{u} = \frac{13v-5}{v}$$

$$\frac{u}{2} = \frac{v}{13v-5}$$

$$u = \frac{2v}{13v-5} \quad (2)$$

$$\frac{3}{v} - \frac{1}{u} = 10$$

$$-\frac{1}{u} = 10 - \frac{3}{v}$$

$$-\frac{1}{u} = \frac{10v-3}{v}$$

$$\frac{1}{u} = \frac{-10v+3}{v}$$

$$u = \frac{v}{-10v+3} \quad (3)$$

Sub (2) into (3)

$$\frac{2v}{13v-5} = \frac{v}{-10v+3}$$

$$2v(-10v+3) = v(13v-5)$$

$$-20v^2 + 6v = 13v^2 - 5v$$

$$-33v^2 = -5v - 6v$$

$$-33v^2 = -11v$$

$$\cancel{v^2} - 33v^2 + 11v = 0$$

$$11v(-3v+1) = 0$$

$$v = 0 \quad \text{or} \quad v = \frac{1}{3}$$

(rejected

as denominator cannot be 0)

Cher

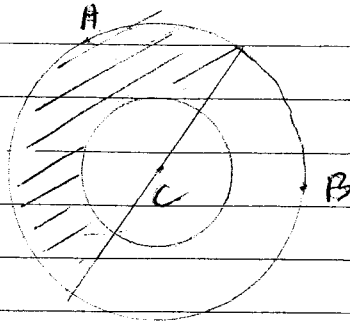
Huang Yafei (9) 4c1

Date:

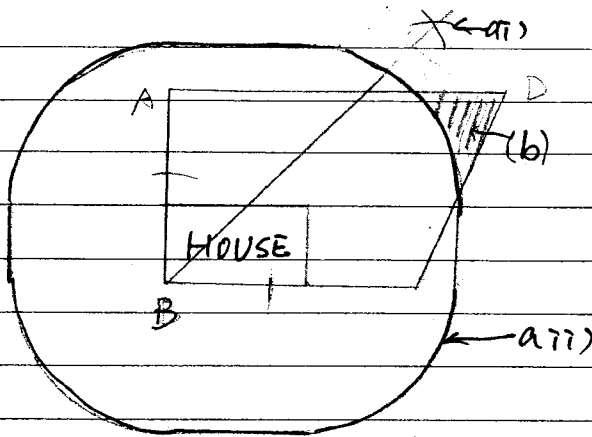
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TYS. 5.4 Loci & constructions

3.



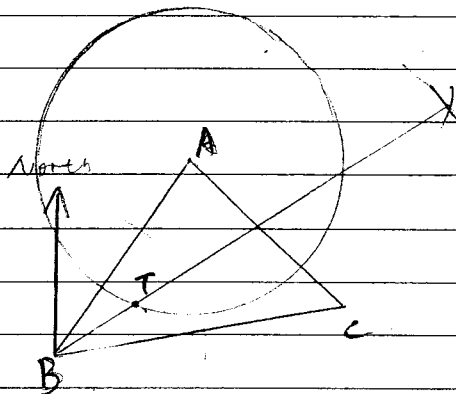
5.



1 cm represent 2m

$$\frac{4m}{2m} \times 1cm = 2cm$$

6.



1 cm represent 50m.
100m is 2cm.

b) TB = 1.2 cm $\times$ 50m = 60m

ii) 056°

Paper 2

4.

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Chen
U-GRADE



Recycle

