Revision Exercise (Coordinate Geometry)

1. (i)

a) 5 c) $\sqrt{178}$ e) $\sqrt{18}$ g) $\sqrt{37}$ i) $\sqrt{288}$ k) $\sqrt{58}$

b) $\sqrt{8}$ d) $\sqrt{34}$ f) 20 h) $\sqrt{26}$ j) $\sqrt{32}$ l) $\sqrt{232}$

1. (ii)

a) $-\frac{4}{3}$ c) $-\frac{13}{3}$ e) -1 g) $-\frac{1}{6}$ i) -1 k) $\frac{3}{7}$

b) 1 d) $\frac{5}{3}$ f) $-\frac{4}{3}$ h) $-\frac{1}{5}$ j) 1 l) $\frac{7}{3}$

1. (iii)

a) $\left(-\frac{3}{2}, 4\right)$ c) $\left(-\frac{5}{2}, \frac{7}{2}\right)$ e) $\left(\frac{1}{2}, \frac{1}{2}\right)$ g) $\left(7, \frac{19}{2}\right)$ i) $(0,0)$ k) $\left(\frac{3}{2}, -\frac{7}{2}\right)$

b) $(4,5)$ d) $\left(\frac{7}{2}, \frac{9}{2}\right)$ f) $(-9,3)$ h) $\left(\frac{15}{2}, \frac{5}{2}\right)$ j) $(2,2)$ l) $(0,0)$

1. (iv)

a) $\frac{3}{4}$ c) $\frac{3}{13}$ e) 1 g) 6 i) 1 k) $-\frac{7}{3}$

b) -1 d) $-\frac{3}{5}$ f) $\frac{3}{4}$ h) 5 j) -1 l) $-\frac{3}{7}$

1. (vi)

a) $y = \frac{3}{4}x + \frac{41}{8}$ d) $y = -\frac{3}{5}x + \frac{33}{5}$ g) $y = 6x - \frac{65}{2}$ j) $y = -x + 4$

b) $y = -x + 9$ e) $y = x$ h) $y = 5x - 35$ k) $y = -\frac{7}{3}x$

c) $y = \frac{3}{13}x + \frac{53}{13}$ f) $y = \frac{3}{4}x + \frac{39}{4}$ i) $y = x$ l) $y = -\frac{3}{7}x$

1. (vii)

a) $\left(0, \frac{41}{8}\right)$ c) $\left(0, \frac{53}{13}\right)$ e) $(0,0)$ g) $\left(0, -\frac{65}{2}\right)$ i) $(0,0)$ k) $(0,0)$

b) $(0,9)$ d) $\left(0, \frac{33}{5}\right)$ f) $\left(0, \frac{39}{4}\right)$ h) $(0,-35)$ j) $(0,4)$ l) $(0,0)$

2.

a) $y = 4x - 8$ c) $2y = x + 6$ e) $5y = x + 15$

b) $y = -2x - 1$ d) $6y = 5x + 39$ f) $3y = -2x + 10$

3.

a) $y = 4x - 11$ c) $3y = -2x + 8$ e) $y = -x + 18$

b) $2y = x - 4$ d) $5y = -4x + 25$ f) $2y = -x - 1$

4.

a) $2y = x - 4$ c) $2y = -x + 17$ e) $y = -x$

b) $3y = 2x + 7$ d) $y = x + 4$ f) $2y = -3x + 5$

5.

a) $y = x + 1$ and $a = 1$ b) $y = \frac{4}{3}x - 4$ and $b = 1$ c) $y = x + 1$ and $c = 1$

6.

a) $m_{Line1} = -\frac{1}{2}$; $m_{Line2} = 2$; $m_{Line3} = -\frac{1}{2}$; $m_{Line4} = 2$.

    Line 1 // Line 3 and Line 2 // Line 4.   Two pairs of parallel lines.

    Line 1 $\perp$ Line 2 and Line 3 $\perp$ Line 4.   Two pairs of perpendicular lines.

    Four lines enclose a rectangle.

b) Isosceles triangle since there is one pair of equal sides.   Area is 9 squared units.

7.

a) $|AB| = \sqrt{65}$ units; $|AC| = \sqrt{130}$ units; $|BC| = \sqrt{65}$ units.   Equal sides are AB and AC.

b) $D = \left(\frac{13}{2}, \frac{11}{2}\right)$.

c) $m_{AC} = \frac{3}{11}$; $m_{BD} = -\frac{11}{3}$.

8. If the coordinates of the diagonals are the same, the quadrilateral is a parallelogram.

i) Midpoint of AC $= \left(\frac{19}{2}, \frac{7}{2}\right)$; Midpoint of BD $= \left(\frac{19}{2}, \frac{7}{2}\right)$

ii) Midpoint of EH $= \left(5, -\frac{7}{2}\right)$; Midpoint of FG $= \left(5, -\frac{7}{2}\right)$

iii) Midpoint of PR $= (8, -3)$; Midpoint of QS $= (8, -3)$

iv) Midpoint of TV $= \left(-3, \frac{3}{2}\right)$; Midpoint of BD $= \left(-3, \frac{3}{2}\right)$

9.

i) $m_{AB} = 0$; m_{BC} is undefined. $AB \perp BC$.

    $|AB| = 8$ units; $|BC| = 6$ units.   Area $= 24$ sq. units.

ii) m_{EF} is undefined; $m_{FG} = 0$. $EF \perp FG$.

    $|EF| = 8$ units; $|FG| = 4$ units.   Area $= 16$ sq. units.

iii) $m_{PR} = -1$; $m_{QR} = 1$. $PR \perp QR$.

    $|PR| = \sqrt{32}$ units; $|QR| = \sqrt{72}$ units.   Area $= 24$ sq. units.

iv) $m_{TU} = -\frac{4}{3}$; $m_{UV} = \frac{3}{4}$. $TU \perp UV$.

    $|TU| = 10$ units; $|UV| = 5$ units.   Area $= 25$ sq. units.