Exercise 1A p 6

1 b. $l = \sqrt{4^2+3^2} = \sqrt{25} = 5$

d. $l = \sqrt{4^2+6^2} = \sqrt{52} = 2\sqrt{13}$

f. $(a+1,\ 2a+3)$
$(a-1,\ 2a-1)\ -$
$2,\ 4$
$l = \sqrt{2^2+4^2} = \sqrt{20} = 2\sqrt{5}$

h. $(12a,\ 5b)$
$(3a,\ 5b)\ -$
$9a,\ 0$

$l = \sqrt{(9a)^2} = 9a$

j. $(p+4q,\ p-q)$
$(p-3q,\ p)\ -$
$7q,\ -q$
$d = \sqrt{49q^2+q^2} = \sqrt{50q^2} = 5q\sqrt{2}$

5 b. $M = \left(\frac{2}{2}, \frac{16}{2}\right) = (1, 8)$

d. $M = \left(-\frac{11}{2}, \frac{9}{2}\right)$

f. $M = \left(\frac{2p+8}{2}, -\frac{4}{2}\right) = (p+4, -2)$

h. $M = \left(a+3, \frac{2b+2}{2}\right) = (a+3, b+1)$

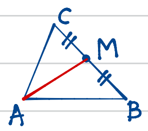
10 b. $m = -\frac{9}{3} = -3$

d. $m = \frac{6}{-8} = -\frac{3}{4}$

f. $m = \frac{q-p-8}{p-q+8} = \frac{-(p-q+8)}{p-q+8} = -1$

h. $m = \frac{0}{4} = 0$

13. Median is a line joining a vertex of a triangle to the mid-point of the opposite side



M $(2,5)$
A $(-1,1)$
$AM = \sqrt{3^2+4^2} = 5$ units

15. A $(2,1)$
B $(2,7)$
C $(-4,-1)$

M $(2,4)$
N $(-1,0)$

a. $MN = \sqrt{3^2+4^2} = 5$ units
$BC = \sqrt{6^2+8^2} = 10$ units

b. $\left.\begin{array}{l} MN = 5 \\ BC = 10 \end{array}\right\}$ $10 = 2 \times 5$
$BC = 2 \times MN$

17. P$(4,1)$
Q$(5,5)$
R$(1,4)$

a. $m_{OR} = \frac{4-0}{1-0} = 4$
$m_{PQ} = \frac{5-1}{5-4} = 4$

$m_{OR} = m_{PQ}$, therefore $OR \parallel PQ$

b. $m_{OP} = \frac{1}{4}$ $\quad m_{RQ} = \frac{5-4}{5-1} = \frac{1}{4}$
$m_{OP} = m_{RQ}$, therefore $OP \parallel RQ$

c. $\left.\begin{array}{l} OP = \sqrt{4^2+1^2} = \sqrt{17} \\ OR = \sqrt{1^2+4^2} = \sqrt{17} \end{array}\right\}$ $OP = OR$

d. 2 pairs of parallel sides and 2 adjacent sides have the same length
→ Rhombus

20 $T(3,2)$ $U(2,5)$ $W(6,1)$

$V(8,7)$

$M = (5,6)$ $TM = \sqrt{4+16} = \sqrt{20}$ units

$N = (7,4)$ $TN = \sqrt{16+4} = \sqrt{20}$ units

$TM = TN \Rightarrow$ Isosceles

22. $A(2,1)$ $B(6,10)$ $C(10,1)$ $G(6,4)$

a. $M = \left(\frac{12}{2}, \frac{2}{2}\right)$

$M(6,1)$

b $BG = \sqrt{0+6^2} = 6$ units

$GM = \sqrt{0^2+3^2} = 3$ units

$BG = 6$ units

$GM = 3$ units

Therefore $BG = 2GM$

$m_{BG} = \frac{6}{0}$

$m_{GM} = \frac{3}{0}$

BG & GM have the same gradient

with G as common point, then BGM is a straight line

c $N = \left(\frac{16}{2}, \frac{11}{2}\right)$

$N\left(8, \frac{11}{2}\right)$

d $AG = \sqrt{16+9} = 5$ units

$GN = \sqrt{4+\frac{9}{4}} = \sqrt{\frac{25}{4}} = \frac{5}{2}$ units

$AG = 2GN$

$m_{AG} = \frac{3}{4}$

$m_{AN} = \frac{9/2}{6} = \frac{3}{4}$