Name: _____

WORKSHEET

Component and polar forms of vectors

1 Find the magnitude of the following vectors:

a $(3, 4)$

b $(12, 5)$

c $(4, 7)$

d $(-2, -3)$

e $\begin{pmatrix} -5 \\ 2 \end{pmatrix}$

f $\begin{pmatrix} 6 \\ -2 \end{pmatrix}$

g $\begin{pmatrix} -9 \\ -1 \end{pmatrix}$

h $\begin{pmatrix} 7 \\ -3 \end{pmatrix}$

2 Find the direction of the following vectors.

a $(2, 5)$

b $(7, 1)$

c $(-2, 0)$

d $(-3, 5)$

e $(-2.5, 6)$

f $(-2, 1)$

g $(-3, -4)$

h $\begin{pmatrix} 0 \\ -4 \end{pmatrix}$

i $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$

j $\begin{pmatrix} 7 \\ -2 \end{pmatrix}$

3 Convert the following position vectors to polar form.

a $(4, 7)$

b $(-5, -2)$

c $(8, -3)$

d $(-1, 6)$

e $\begin{pmatrix} 7 \\ -5 \end{pmatrix}$

f $\begin{pmatrix} -6 \\ -4 \end{pmatrix}$

4 Convert the following position vectors to component form.

a $(4, 25°)$

b $(6, 165°)$

c $(1, 308°)$

d $(3.1, 249°)$

e $(5.5, 102°)$

f $(9.3, 271°)$

g $(2.6, 193°)$

h $(7, 8°)$

i $(0.5, 72°)$

j $(4.6, 118°)$

k $(6.3, 48°28')$

l (r, θ)

Answers

1 **a** 5
b 13
c 8.1
d 3.6
e 5.4
f 6.3
g 9.1
h 7.6

2 **a** 68.2°
b 8.1°
c 180°
d 121.0°
e 112.6°
f 153.4°
g 233.1°
h 270°
i 303.7°
j 344.1°

3 **a** (8.1, 60.3°)
b (5.4, 201.8°)
c (8.5, 339.4°)
d (6.1, 99.5°)
e (8.6, 324.5°)
f (7.2, 213.7°)

4 **a** (3.63, 1.69)
b (−5.80, 1.55)
c (0.62, −0.79)
d (−1.11, −2.89)
e (−1.14, 5.38)
f (0.16, −9.30)
g (−2.53, −0.58)
h (6.93, 0.97)
i (0.15, 0.48)
j (−2.16, 4.06)
k (4.18, 4.72)
l $(r\cos\theta, r\sin\theta)$