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3. Use algebra to obtain the set of values of x for which

$$\left|\frac{x^2 + 3x + 10}{x + 2}\right| < 7 - x$$

(9)

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7. A transformation from the z-plane to the w-plane is given by

$$w = \frac{(1 + \mathrm{i})z + 2(1 - \mathrm{i})}{z - \mathrm{i}} \qquad z \neq \mathrm{i}$$

The transformation maps points on the imaginary axis in the z-plane onto a line in the w-plane.

(a) Find an equation for this line.

(2)

The transformation maps points on the real axis in the z-plane onto a circle in the w-plane.

(b) Find the centre and radius of this circle.

(6)

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2. Use algebra to find the set of values of x for which

$$\frac{6}{x-3} \leqslant x + 2$$

(7)