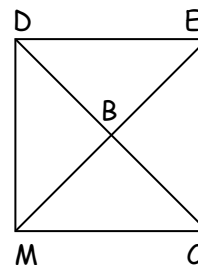


Use the diagram of square DECM at the right for #1 - 2.



1. If $DM = 6x^2 + 20x$ and $EC = 16$, find x .

$$6x^2 + 20x - 16 = 0 \quad x = 2/3, -4$$

$$3x^2 + 10x - 8 = 0$$

$$(3x - 2)(x + 4) = 0$$

2. If $m\angle DEB = (x + 2y + 6)^\circ$ and $m\angle EBD = (2x + 5y)^\circ$, solve for x and y .

$$\begin{cases} x + 2y + 6 = 45 \\ 2x + 5y = 90 \\ x + 2y = 39 \end{cases}$$

$$\begin{array}{r} 2x + 5y = 90 \\ -2x - 4y = -78 \\ \hline y = 12 \\ x = 15 \end{array}$$

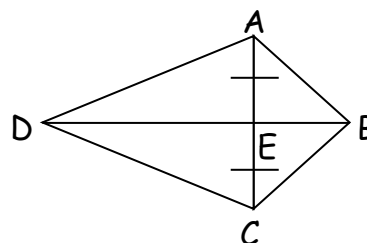
(15, 12)

3. Given: ABCD is a kite

$$AD = 6x - 4$$

$$\angle AEB = (5x^2 - 35x)^\circ$$

Find: DC



$$5x^2 - 35x = 90$$

$$5(x^2 - 7x - 18) = 0$$

$$5(x - 9)(x + 2) = 0$$

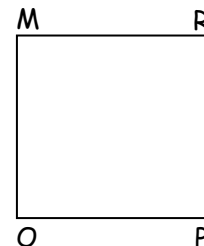
$$x = 9, -2$$

DC = 50

4. Given: MOPR is a square with perimeter 60

$$MO = x + 2y + 1 \text{ and } \angle O = (y^2 + 3y + 2)^\circ$$

Solve for x and y .



$$x + 2y + 1 = 15$$

$$y^2 + 3y + 2 = 90$$

$$y^2 + 3y - 88 = 0$$

$$(y + 11)(y - 8) = 0$$

$$y = -11, 8$$

$$x = 36 \quad x = -2$$

(36, -11) (-2, 8)

5. Given: NICK is a rectangle

$$m\angle CKN = (10x^2)^\circ$$

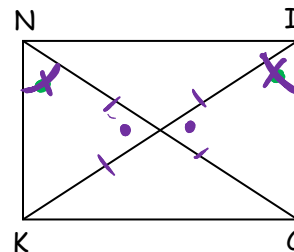
$$m\angle KNC = (24 - 9x)^\circ$$

Find: $m\angle CIK$

$$10x^2 = 90$$

$$x = \pm 3$$

$m\angle CIK = 51^\circ$



6. Given: DONE is a rectangle

$$DR = x + y, ER = 2y - 7, DN = -3x$$

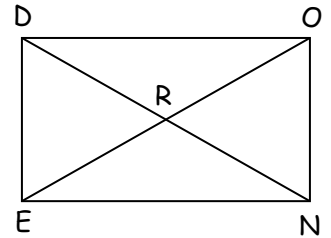
Solve for x and y.

$$\begin{cases} x + y = 2y - 7 \\ x + y + 2y - 7 = -3x \end{cases}$$

$$\begin{aligned} 3x - 3y &= -21 \\ 4x + 3y &= 7 \\ \hline 7x &= -14 \end{aligned}$$

$$\begin{cases} (x - y = -7) \cdot 3 \\ 4x + 3y = 7 \end{cases}$$

$$\begin{aligned} x &= -2 \\ y &= 5 \end{aligned}$$



7. Given: QRST is a rhombus

$$m\angle 3 = (y^2 - 9y)^\circ, m\angle 1 = (27 - 4y)^\circ$$

Find: $m\angle 2$

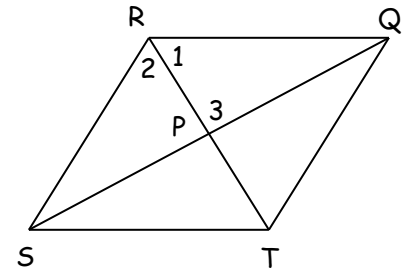
$$y^2 - 9y = 90$$

$$y^2 - 9y - 90 = 0$$

$$(y - 15)(y + 6) = 0$$

$$y = 15, -6$$

$$m\angle 1 = m\angle 2 = 51^\circ$$



8. Given: MNPQ is a rhombus

$$NP = 9x - 8y + 4, PQ = 5x + 3y - 1$$

$$m\angle 2 = (2x + 3y + 2)^\circ, m\angle 3 = (4x - y)^\circ$$

Find: $m\angle N$

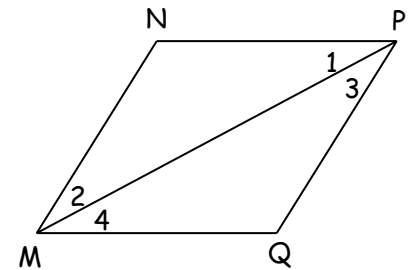
$$\begin{cases} 9x - 8y + 4 = 5x + 3y - 1 \\ 2x + 3y + 2 = 4x - y \end{cases}$$

$$\begin{cases} 4x - 11y = -5 \\ -2x + 4y = -2 \end{cases}$$

$$\begin{cases} 4x - 11y = -5 \\ (-2x + 4y = -2) \cdot 2 \end{cases}$$

$$\begin{cases} 4x - 11y = -5 \\ -4x + 8y = -4 \end{cases}$$

$$\begin{aligned} 4x - 11y &= -5 \\ -4x + 8y &= -4 \\ \hline -3y &= -9 \\ y &= 3 \\ x &= 7 \end{aligned}$$



$$m\angle N = 130^\circ$$

9. Given: ABCD is an isosceles trapezoid.

$$\angle A = (x + 90)^\circ, \angle B = (2x + 4y - 40)^\circ,$$

and $\angle C = (2y + 10)^\circ$. Find the measures of all the angles.

$$\begin{cases} x + 90 = 2x + 4y - 40 \\ x + 90 + 2y + 10 = 180 \end{cases}$$

$$\begin{cases} x + 90 + 2y + 10 = 180 \\ x + 4y = 130 \end{cases}$$

$$x + 4y = 130$$

$$(x + 2y = 80) \cdot -1$$

$$\begin{aligned} x + 4y &= 130 \\ -x - 2y &= -80 \\ \hline 2y &= 50 \\ y &= 25 \\ x &= 30 \end{aligned}$$

