Year 1 Week 1 Extension Questions

1. Rearrange $\frac{1}{xy} = 4 - \frac{3}{y}$ to make x the subject.

[3]

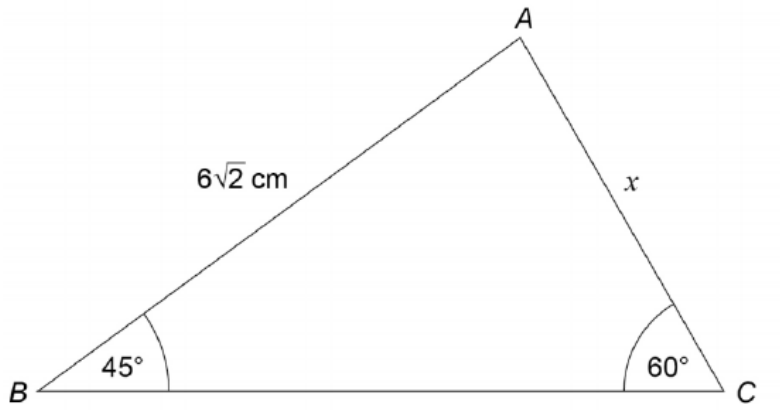
2. Solve the simultaneous equations $xy = 2$ and $y = 3x + 5$

Do **not** use trial and improvement.
You **must** show your working.

[6]

3. In the triangle ABC,

$AB = 6\sqrt{2}$cm, angle $ABC = 45°$ and angle $ACB = 60°$.



Work out the value of x.

Give your answer in the form $a\sqrt{b}$, where a and b are integers.
You **must** show your working.

[5]

4. A straight line passes through the points $(-4, 7)$, $(6, -5)$ and $(8, t)$.
Use an algebraic method to work out the value of t.
You **must** show your working.

[3]

5. Solve $x^{-\frac{1}{4}} = 0.2$

[3]
[Total 20 marks]

Model Answers

1. $\frac{1}{xy} = 4 - \frac{3}{y}$

$\frac{1}{xy} = \frac{4y - 3}{y}$

$xy = \frac{y}{4y - 3}$

$x = \frac{1}{4y - 3}$

2. $xy = 2 \qquad y = 3x + 5$

$y = \frac{2}{x} \Rightarrow \frac{2}{x} = 3x + 5$

$2 = 3x^2 + 5x$

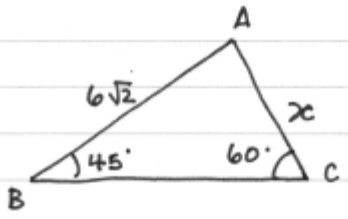
$0 = 3x^2 + 5x - 2$

$0 = (3x - 1)(x + 2)$

$x = \frac{1}{3}$ or $x = -2$

$y = 6 \qquad y = -1$

3.



Applying the sine rule

$$\frac{x}{\sin 45} = \frac{6\sqrt{2}}{\sin 60}$$

$$x = \frac{6\sqrt{2}\sin 45}{\sin 60}$$

$$= \frac{6\sqrt{2} \cdot \frac{\sqrt{2}}{2}}{\frac{\sqrt{3}}{2}}$$

$$= \frac{6}{\sqrt{3}/2}$$

$$= \frac{12}{\sqrt{3}} \frac{\sqrt{3}}{\sqrt{3}}$$

$$= 4\sqrt{3}$$

4. $$\frac{-5-7}{6--4} = \frac{t--5}{8-6}$$

$$\frac{-12}{10} = \frac{t+5}{2}$$

$$-2.4 = t + 5 \quad \Rightarrow \quad t = -7.4$$

5. $$x^{-1/4} = 0.2$$

$$\frac{1}{\sqrt[4]{x}} = \frac{1}{5}$$

$$\sqrt[4]{x} = 5$$

$$x = 5^4 = 625$$