Algebraic manipulation – 2020 O Level Math D

1.

(b) Simplify $6t^3 \div \left(\dfrac{2}{3}t^2\right)$.

.... [2]

Amira drives 40 km to work.

(a) Amira takes x minutes to drive the first 30 km of the journey.
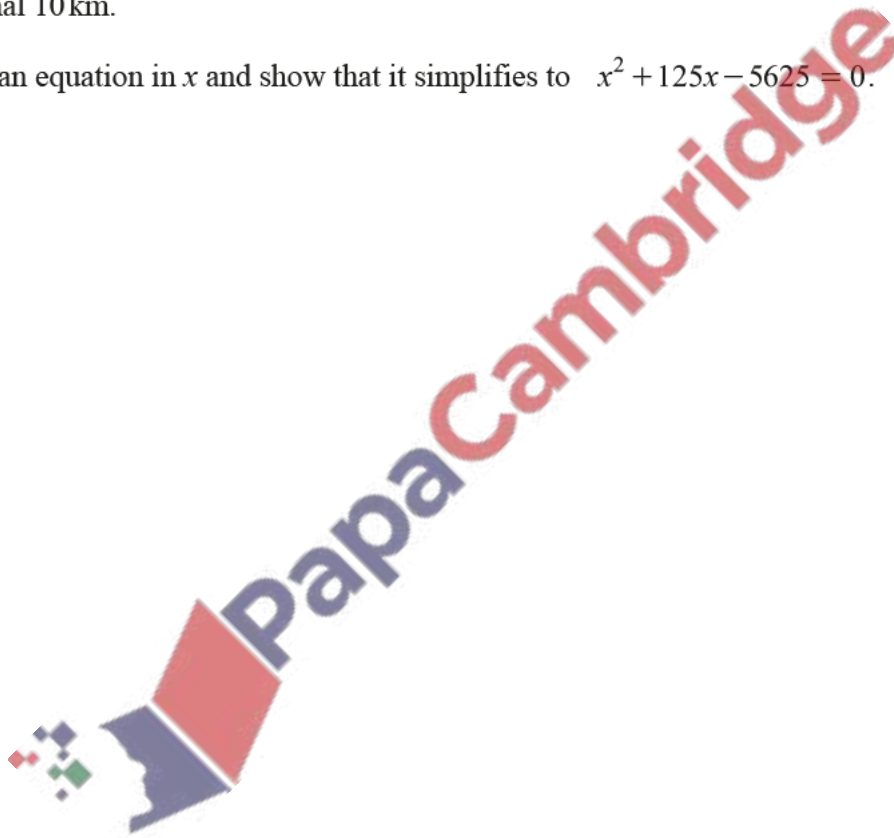
Show that her average speed in km/h for the first 30 km of the journey is $\dfrac{1800}{x}$.

[1]

(b) Amira's average speed in km/h for the final 10 km of the journey is $\dfrac{600}{x-25}$.

Her average speed for the first 30 km of the journey is 8 km/h slower than her average speed for the final 10 km.

Form an equation in x and show that it simplifies to $x^2 + 125x - 5625 = 0$.
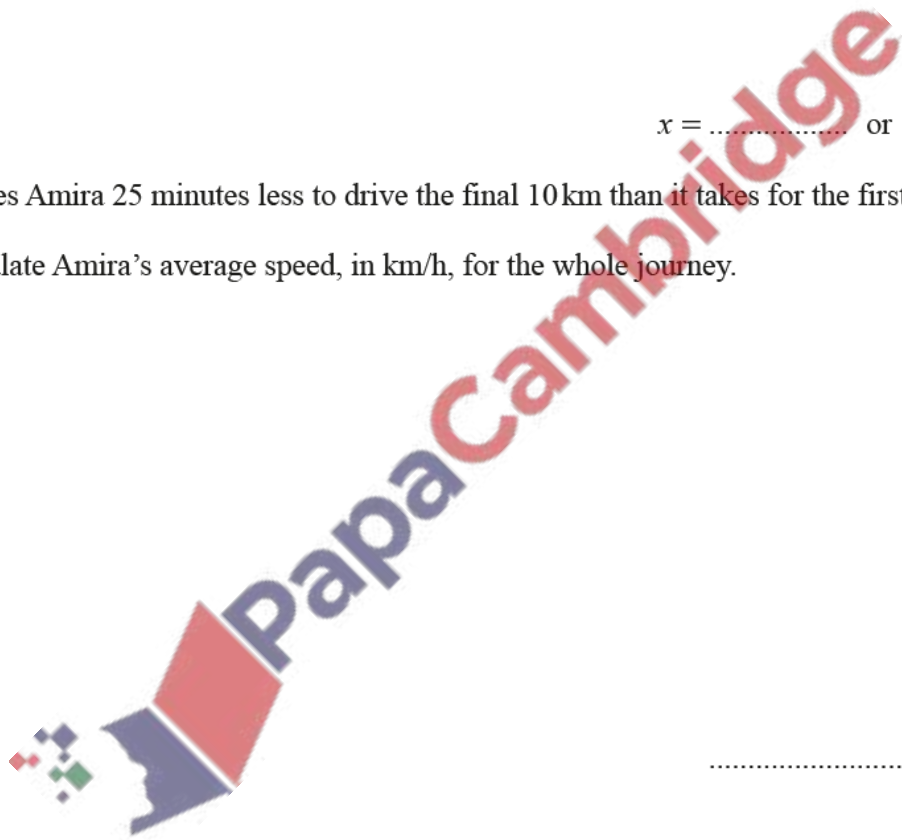
[3]

(c) Solve the equation $x^2 + 125x - 5625 = 0$.

Show your working and give each answer correct to 1 decimal place.

$x = $ .... or $x = $ .... [3]

(d) It takes Amira 25 minutes less to drive the final 10 km than it takes for the first 30 km.

Calculate Amira's average speed, in km/h, for the whole journey.

.... km/h [3]

3.

Factorise.

(a) $6c^3 + 9c$

.... [1]

(b) $5ay - 2bx - 2by + 5ax$

.... [2]

4.
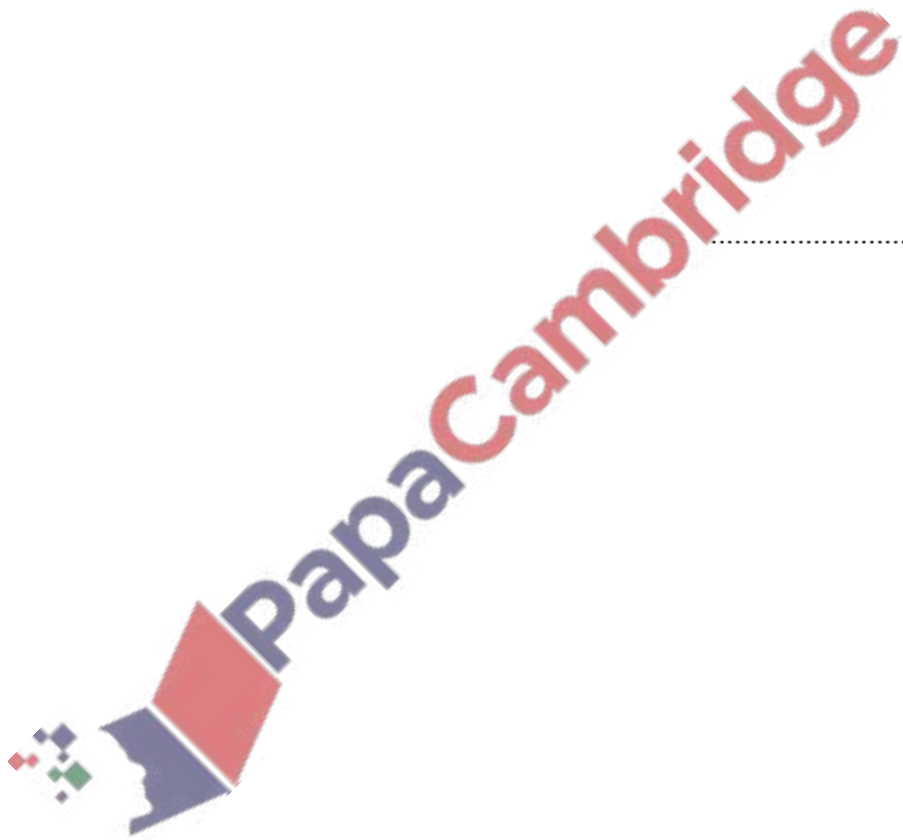
Write as a single fraction in its simplest form.

$$\frac{2x+3}{x+4} - \frac{5}{3x-2}$$

.... [4]
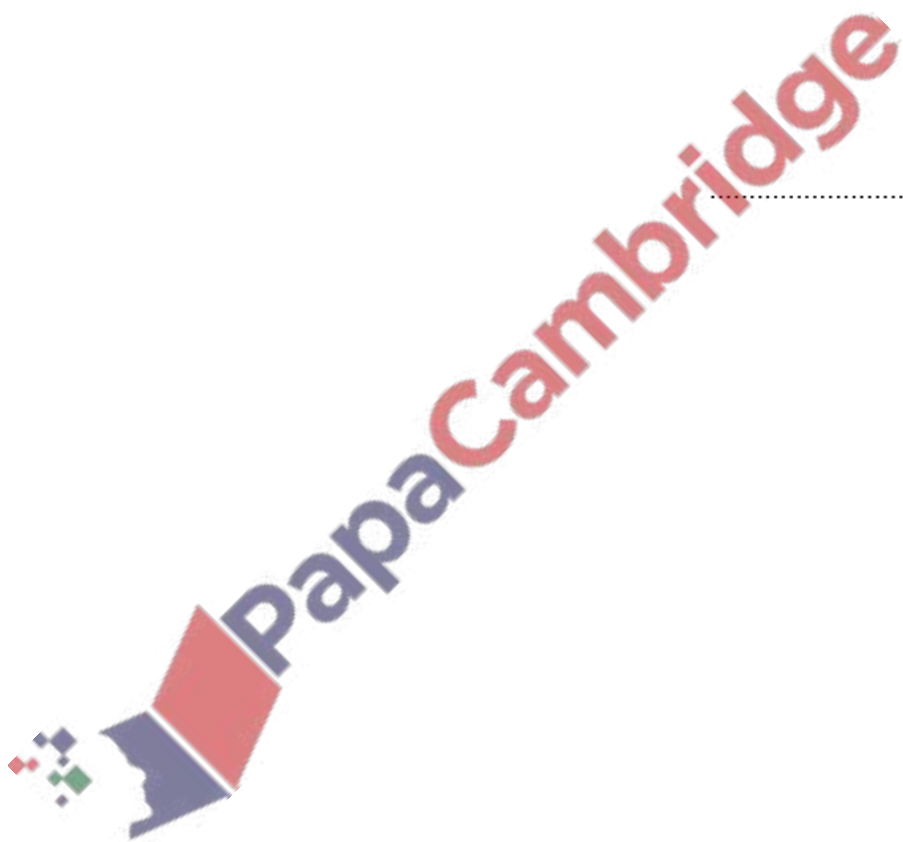
5.
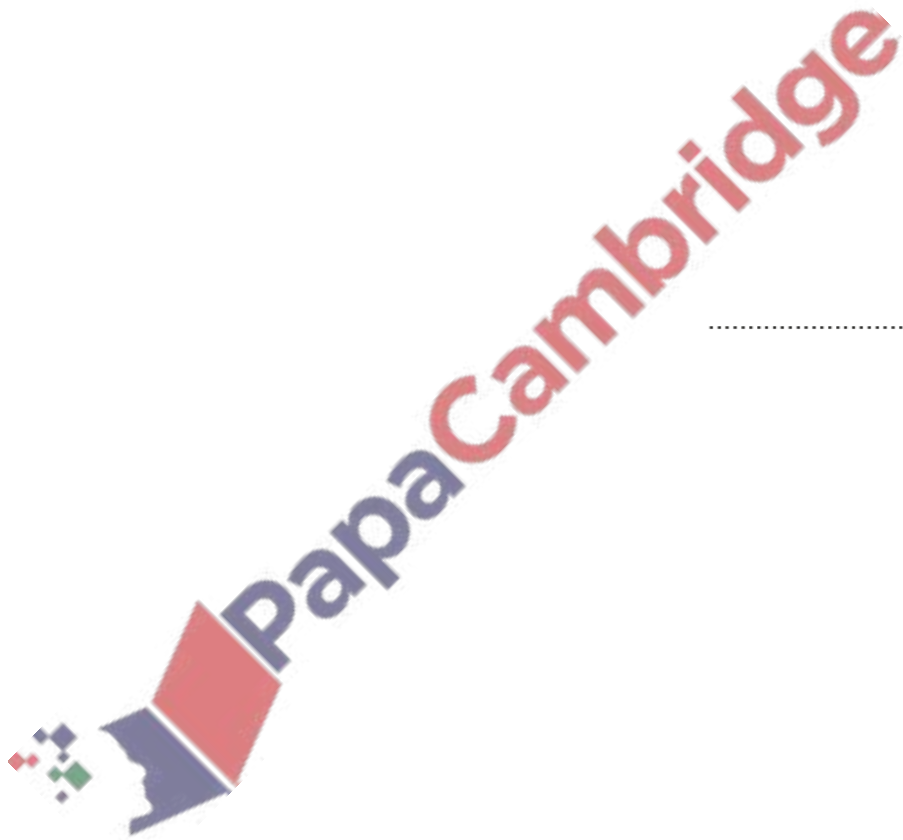
Express as a single fraction in its simplest form.

$$\frac{5}{2x-1} - \frac{3}{x+4}$$

.... [3]