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2(b)

from part (a)

$$ar^2 = 4$$

case $r = -\frac{1}{3}$

$$a \left(-\frac{1}{3}\right)^2 = 4$$

$$a \times \frac{1}{9} = 4$$

$$a = 4 \times 9$$

$$a = 36$$

(b)(iii) $a = 36 \quad r = -\frac{1}{3}$

$$S_{\infty} = \frac{a}{1-r}$$

$$S_{\infty} = \frac{36}{1 - \left(-\frac{1}{3}\right)}$$

$$S_{\infty} = \frac{36}{\frac{4}{3}} = \frac{36}{1} \div \frac{4}{3} = 36 \times \frac{3}{4}$$

$$S_{\infty} = 27$$

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7(b)

$$\text{let } z = a + bi \text{ and } z^* = a - bi$$

$$2z + z^* = 12 + 3i$$

$$2(a + bi) + a - bi = 12 + 3i$$

$$2a + 2bi + a - bi = 12 + 3i$$

$$3a + bi = 12 + 3i$$

Equate Real and Imaginary parts

Real

$$3a = 12$$

$$a = 4$$

Imaginary

$$b = 3$$

$$z = 4 + 3i$$

$$\begin{array}{l} \text{note} \\ \text{not} \\ \hline bi = 3i \end{array}$$

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Equations involving fractions

$$11 \quad x + \frac{1}{x} = \frac{5}{2}$$

multiply each term by $2x$

$$2x \cdot x + 2x \cdot \frac{1}{x} = \frac{5}{2} \cdot 2x$$

$$2x^2 + 2 = 5x$$

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

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

$$2x - 1 = 0 \Rightarrow$$

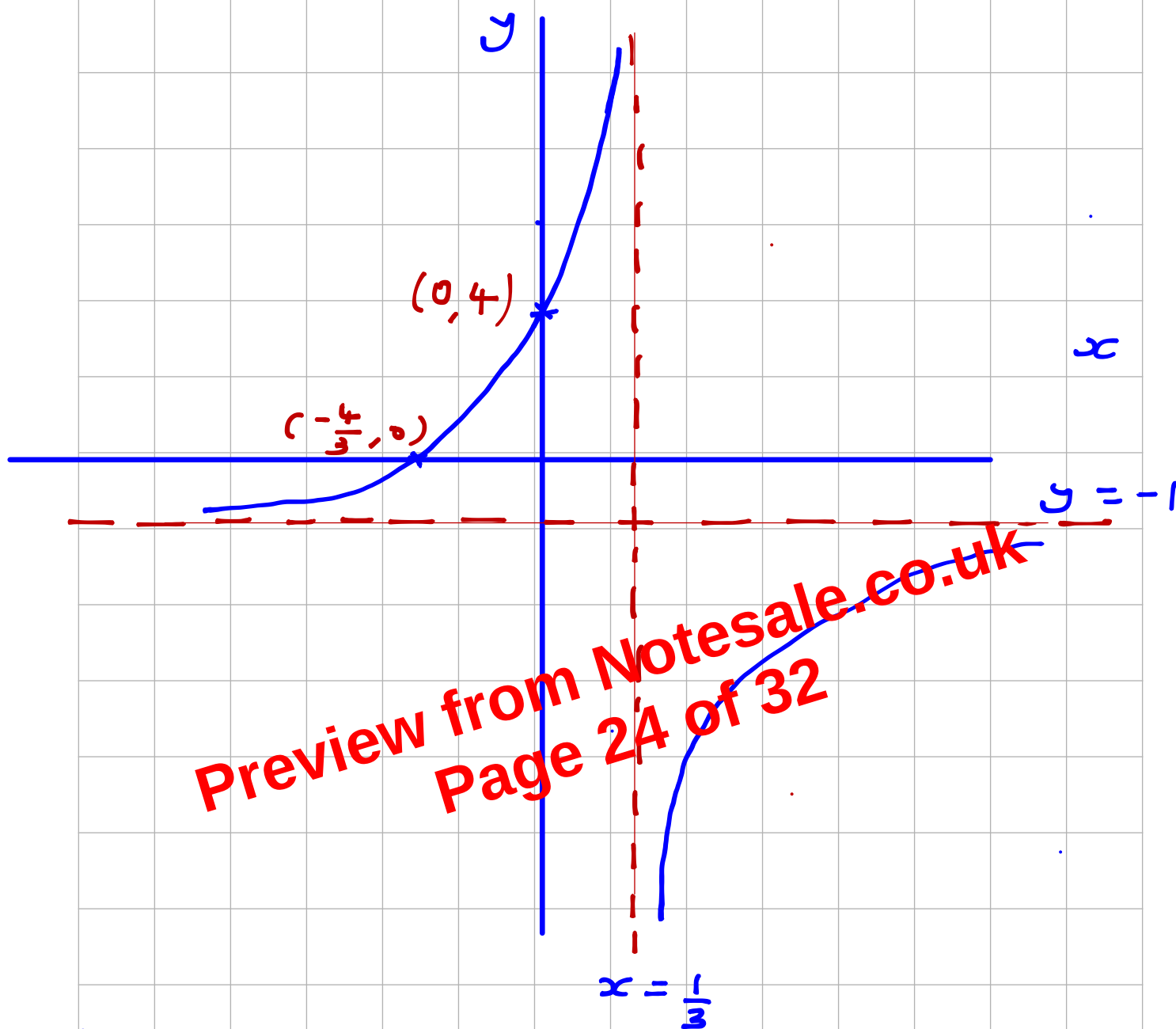
$$x = \frac{1}{2}$$

$$x - 2 = 0 \Rightarrow$$

$$x = 2$$

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13(c)



(d)

Intersection

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

$$3x+4 = 1-3x$$

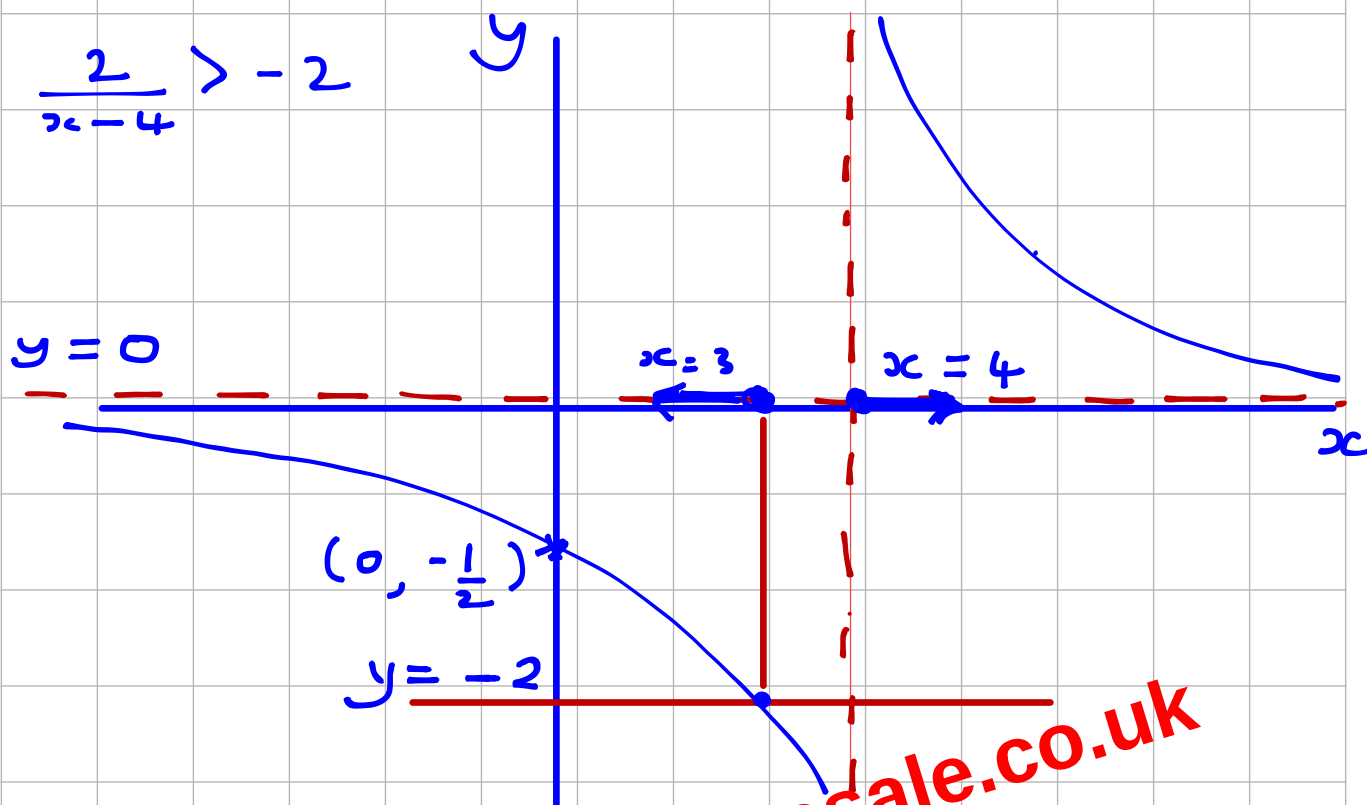
$$6x = -3 \Rightarrow x = -\frac{1}{2}$$

intersection
 $(-\frac{1}{2}, 1)$

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Solve

$$\frac{2}{x-4} > -2$$



solution

critical values $x = 3$ and $x = 4$

$$\{x < 3\} \cup \{x > 4\}$$

Also

note $\frac{2}{x-4} < -2$ when $3 < x < 4$