



Your ID number									
<div></div>									
<div>0</div>	<div>0</div>	<div>0</div>	<div>0</div>	<div>0</div>	<div>0</div>	<div>0</div>	<div>0</div>	<div>0</div>	<div>0</div>
<div>1</div>	<div>1</div>	<div>1</div>	<div>1</div>	<div>1</div>	<div>1</div>	<div>1</div>	<div>1</div>	<div>1</div>	<div>1</div>
<div>2</div>	<div>2</div>	<div>2</div>	<div>2</div>	<div>2</div>	<div>2</div>	<div>2</div>	<div>2</div>	<div>2</div>	<div>2</div>
<div>3</div>	<div>3</div>	<div>3</div>	<div>3</div>	<div>3</div>	<div>3</div>	<div>3</div>	<div>3</div>	<div>3</div>	<div>3</div>
<div>4</div>	<div>4</div>	<div>4</div>	<div>4</div>	<div>4</div>	<div>4</div>	<div>4</div>	<div>4</div>	<div>4</div>	<div>4</div>
<div>5</div>	<div>5</div>	<div>5</div>	<div>5</div>	<div>5</div>	<div>5</div>	<div>5</div>	<div>5</div>	<div>5</div>	<div>5</div>
<div>6</div>	<div>6</div>	<div>6</div>	<div>6</div>	<div>6</div>	<div>6</div>	<div>6</div>	<div>6</div>	<div>6</div>	<div>6</div>
<div>7</div>	<div>7</div>	<div>7</div>	<div>7</div>	<div>7</div>	<div>7</div>	<div>7</div>	<div>7</div>	<div>7</div>	<div>7</div>
<div>8</div>	<div>8</div>	<div>8</div>	<div>8</div>	<div>8</div>	<div>8</div>	<div>8</div>	<div>8</div>	<div>8</div>	<div>8</div>
<div>9</div>	<div>9</div>	<div>9</div>	<div>9</div>	<div>9</div>	<div>9</div>	<div>9</div>	<div>9</div>	<div>9</div>	<div>9</div>

Your name:

Module: MA140

Date: 14 Oct 2025

Duration: 40 minutes.

You may **not** use notes, calculator, or any electronic device.

Question 1 What is the largest possible subset of \mathbb{R} that could be the **domain** of the function:

$$f(x) = \frac{2x}{x^2 + 2x - 8}.$$

There may be more than one correct answer

- | | |
|------------------------------------------------------------------------|-----------------------------------------------|
| <input type="checkbox"/> all of \mathbb{R} | <input type="checkbox"/> $x = 2$ and $x = -4$ |
| <input type="checkbox"/> $(-\infty, -4) \cup (-4, 2) \cup (2, \infty)$ | <input type="checkbox"/> $\mathbb{R}/-4, 2$ |

Question 2 What of the following is $f(x) = \frac{8x - 12}{x^2 - 2x - 3}$ expressed as *partial fractions*

- | | | | |
|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|
| <input type="checkbox"/> $\frac{3}{x+3} + \frac{5}{x-1}$ | <input type="checkbox"/> $\frac{3}{x+3} - \frac{5}{x-1}$ | <input type="checkbox"/> $\frac{3}{x-3} + \frac{5}{x+1}$ | <input type="checkbox"/> $\frac{3}{x-3} - \frac{5}{x+1}$ |
|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|----------------------------------------------------------|

Question 3 Let $f(x) = \begin{cases} x+2 & x \leq -2 \\ -x & x > 2. \end{cases}$ Why type of *discontinuity* does f have at $x = 2$?

- | | |
|-------------------------------------------------|----------------------------------------------------|
| <input type="checkbox"/> Jump discontinuity | <input type="checkbox"/> None (f is continuous) |
| <input type="checkbox"/> Infinite discontinuity | <input type="checkbox"/> Removable discontinuity |