eClassroom

GCSE Mathematics

Inequalities

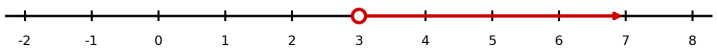
Worked Solutions

Pearson Edexcel GCSE & iGCSE Mathematics

Section A — Foundation — Worked Solutions

[Fluency] Question 1

$3x > 9 \Rightarrow x > 3$



∴ **x>3**

[Fluency] Question 2

$-2x \leq 8 \Rightarrow x \geq -4$ (flip: dividing by negative)

∴ **x≥–4**

[Fluency] Question 3

$x < 4$

∴ **x<4**

[Fluency] Question 4

$-1 \leq 2x + 3 < 7 \Rightarrow -4 \leq 2x < 4 \Rightarrow -2 \leq x < 2$

∴

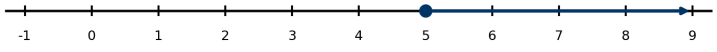
[Fluency] Question 5

List: –2,–1,0,1,2

∴ **–2, –1, 0, 1, 2**

[Reasoning] Question 6

$4x - 3 \geq 2x + 7 \Rightarrow 2x \geq 10 \Rightarrow x \geq 5$



∴ **x≥5**

[Reasoning] Question 7

$3n < 22 \Rightarrow n < 7.33$

Largest integer = 7

∴ **n=7**

[Reasoning] Question 8

$2 \leq 3x - 1 < 11 \Rightarrow 3 \leq 3x < 12 \Rightarrow 1 \leq x < 4$

∴

[Problem Solving] Question 9

$-5 < 2x + 1 \leq 7 \Rightarrow -6 < 2x \leq 6 \Rightarrow -3 < x \leq 3$

Integer values: –2,–1,0,1,2,3

∴ **–2, –1, 0, 1, 2, 3**

[Problem Solving] Question 10

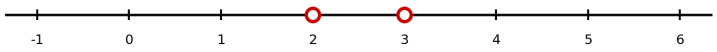
P=2(x+x+4)=4x+8. 28 < 4x+8 ≤ 40 → 5 < x ≤ 8

∴

Section B — Higher — Worked Solutions

[Fluency] Question 1

$(x-2)(x-3)>0 \Rightarrow x<2$ or $x>3$



∴ **x<2 or x>3**

[Fluency] Question 2

$(x-4)(x+3) \leq 0 \Rightarrow -3 \leq x \leq 4$

∴

[Fluency] Question 3

$(2x-3)(x+2)<0 \Rightarrow -2<x<\frac{3}{2}$

∴

[Reasoning] Question 4

Draw y=x–1 (dashed, above), y=3 (solid, below), x=0 (solid, right)

Shade region satisfying all three simultaneously

∴ **Region bounded by three lines ✓**

[Reasoning] Question 5

$(x-5)(x+2)<0 \Rightarrow -2<x<5$

Integer values: –1,0,1,2,3,4

∴ **–1, 0, 1, 2, 3, 4**

[Reasoning] Question 6

$x^2 - 4 > 0 \Rightarrow x < -2$ or $x > 2$

$2x + 1 < 7 \Rightarrow x < 3$

Intersection: x < –2 or 2 < x < 3

∴ **Paragraph('caseSensitive': 1 'encoding': 'utf8' 'text': '{x : x < –2} ∪ {x : 2 < x < 3}' 'frags': [ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text='{x : x ', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text='<', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text=' ', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text='–', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text='2} ', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text='∪', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text=' {x : 2 ', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text='<', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text=' x ', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text='<', textColor=Color(.066667,.066667,.066667,1), us_lines=[]), ParaFrag(__tag__='para', bold=0, fontName='Helvetica', fontSize=10, greek=0, italic=0, link=[], rise=0, text=' 3}', textColor=Color(.066667,.066667,.066667,1), us_lines=[])] 'style': 'bulletText': None 'debug': 0) #Paragraph**

[Problem Solving] Question 7

$\Delta = k^2 - 36 < 0 \Rightarrow -6 < k < 6$

∴

[Problem Solving] Question 8

$x^2 - 6x + 5 \leq 0 \Rightarrow (x-1)(x-5) \leq 0 \Rightarrow 1 \leq x \leq 5$

$x^2 + x - 6 > 0 \Rightarrow (x+3)(x-2) > 0 \Rightarrow x < -3$ or $x > 2$

Intersection: $2 < x \leq 5$

$\therefore$