1. A number, *n*, is rounded to 2 decimal places.
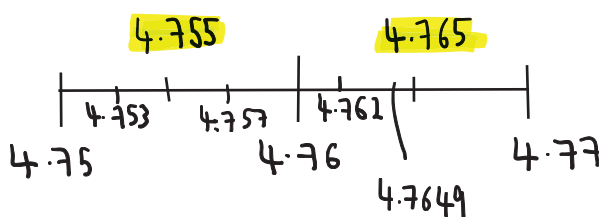The result is 4.76

Using inequalities, write down the error interval for *n*.
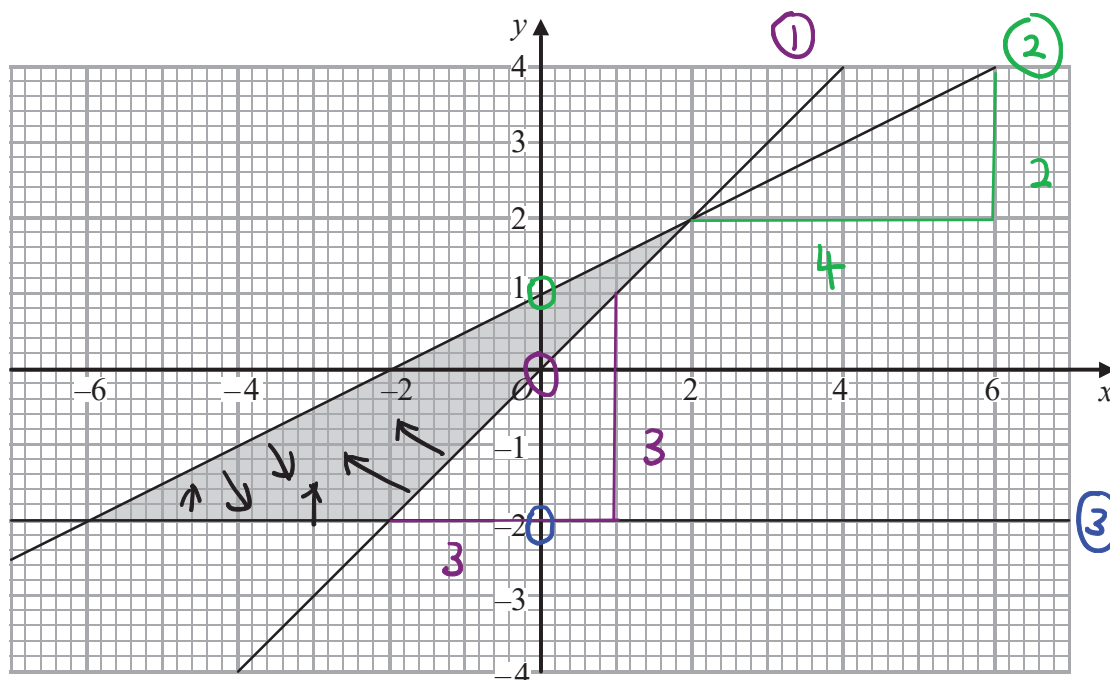
4.755

4.765

| 4.753 | 4.757 | 4.761 |

4.75   4.76   4.77

4.7649

①   ①

$4.755 \leq n < 4.765$

(Total for Question   is 2 marks)

2.

Write down the three inequalities that define the shaded region.

① $\dfrac{\Delta y}{\Delta x} = \dfrac{3}{3} = 1.$ $m = 1.$ $c = 0.$ $\underline{y = x}$ ↑ ①

② $\dfrac{\Delta y}{\Delta x} = \dfrac{2}{4} = 0.5.$ $m = 0.5.$ $c = 1.$ $\underline{y = 0.5x + 1}$ ↓ ①

③ $m = 0.$ $c = -2.$ $\underline{y = -2.}$ ↑ ①

$$y \geqslant x$$
$$y \leqslant 0.5x + 1$$
$$y \geqslant -2.$$
①

(Total for Question   is 4 marks)

3. Solve $2x^2 + 3x - 2 > 0$

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

$(2x-1)(x+2) = 0.$ ①

$2x - 1 = 0.$ $x + 2 = 0.$

$2x = 1.$ $x = -2.$

$x = \frac{1}{2}.$ ①
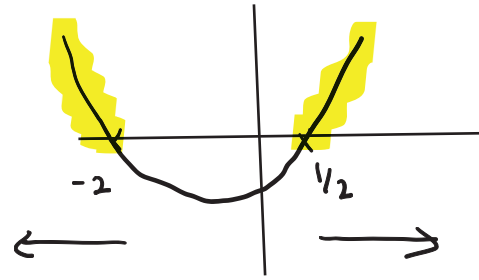
$x < -2, \; x > \frac{1}{2}.$ ①

(Total for Question   is 3 marks)

4.   Here is a rectangle and a right-angled triangle.

$3x - 2$ b

$x - 1$
h

$2x$
h

x b
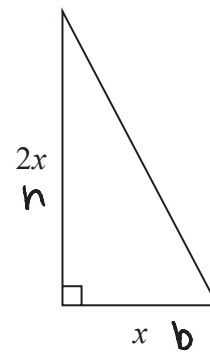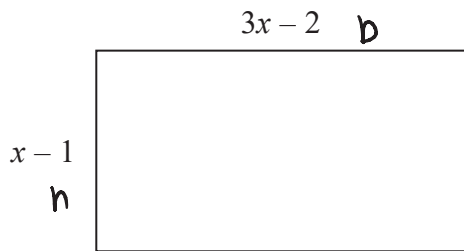
All measurements are in centimetres.
The area of the rectangle is greater than the area of the triangle.

Find the set of possible values of x.

Area of rectangle = b × h
Area of triangle = ½ × b × h

Area of rectangle
$(3x - 2)(x - 1)$

Area of triangle
½ × x × 2x
½ × 2x²
x² ✓

$(3x - 2)(x - 1) > x^2$

$3x^2 - 3x - 2x + 2 > x^2$
$3x^2 - 5x + 2 > x^2$
$2x^2 - 5x + 2 > 0$ ✓   × 4
$2x^2 - 4x - x + 2 > 0$ + -5
$2x(x - 2) - 1(x - 2) > 0$
$(2x - 1)(x - 2) > 0$ ✓

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

$x > 2$ ✓

(Total for Question   is 5 marks)

5. n is an integer such that $3n + 2 \leqslant 14$ and $\dfrac{6n}{n^2 + 5} > 1$

Find all the possible values of n.

← *integer values*

Inequalities in terms of n.
Which values of n satisfy both inequalities?

$3n + 2 \leq 14$

$3n \leq 12$

$n \leq 4$ ①

$\dfrac{6n}{n^2+5} > 1$

$6n > n^2 + 5$

$0 > n^2 - 6n + 5$ ①

$0 = (n - 5)(n - 1)$ ①

roots of
quadratic $= n = 5 \quad n = 1$

$1 < n < 5$ ①

↰ *these values of n satisfy*
the inequality

*Sketch graph to*
visualise
the inequalities

$1 < n < 5$
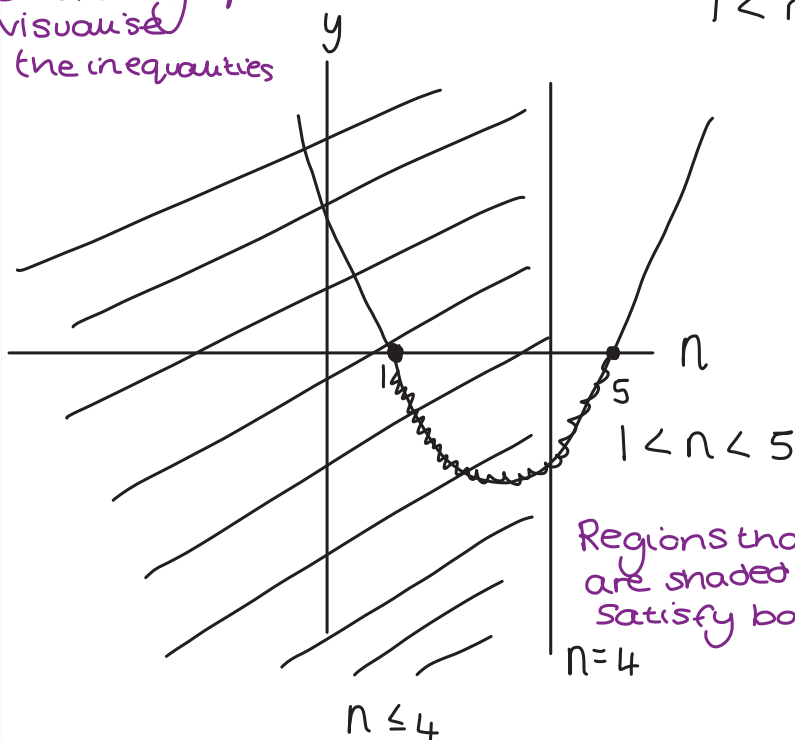
Regions that
are shaded twice
satisfy both $= 1 < n \leq 4$

find integer values for n

$2, 3, 4$ ①

(Total for Question   is 5 marks)

6.   (a) Solve $14n > 11n + 6$

$$14n > 11n + 6.$$

$-11n$ ①

$$3n > 6$$

$\div 3$ $\Big($ $\Big) \div 3$

$$n > 2$$

$n > 2$

(2)

(b) On the number line below, show the set of values of x for which $-2 < x + 3 \leqslant 4$

①

①   ①

$$-6 \quad -5 \quad -4 \quad -3 \quad -2 \quad -1 \quad 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad x$$

$$-2 < x + 3 \leq 4$$

-3 $\Big($ $\quad -5 < x \leq 1 \quad$ $\Big) -3$

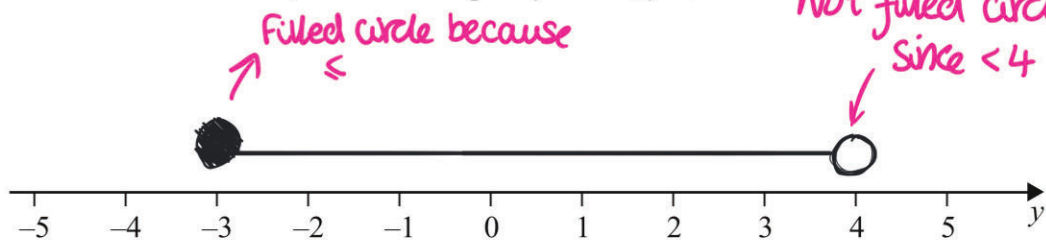(3)

(Total for Question   is 5 marks)

7.   (a) Write down the inequality shown on this number line.
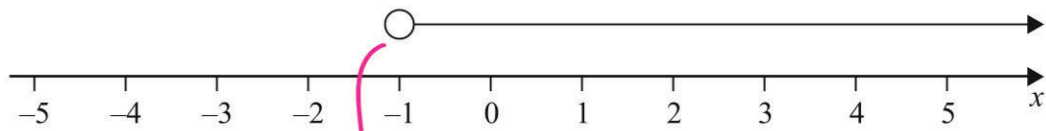
Circle not filled in means < or >

① $x > -1$

(1)

(b) On the number line below, show the inequality $-3 \leqslant y < 4$

Filled circle because ⩽

Not filled circle since < 4

②

(2)