

11

(b) Solve $3x^2 + 6x - 5 = 0$

Show your working clearly.

Give your solutions correct to 3 significant figures.

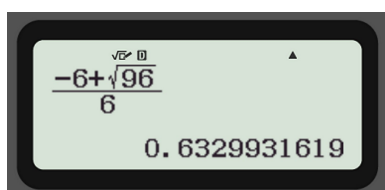
$$3x^2 + 6x - 5$$

$$ax^2 + bx + c$$

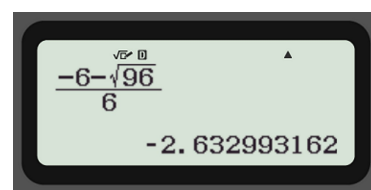
$$a=3 \quad b=6 \quad c=-5$$

$$\frac{-(-6) \pm \sqrt{(-6)^2 - 4(3)(-5)}}{2(3)}$$

$$\frac{-6 + \sqrt{36 - -60}}{6}$$



$$\frac{-6 - \sqrt{36 - -60}}{6}$$



$$x = 0.633$$

$$x = -2.63$$

(Total for Question 11 is 6 marks)

FROM
FORMULA SHEET

The quadratic equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$


15

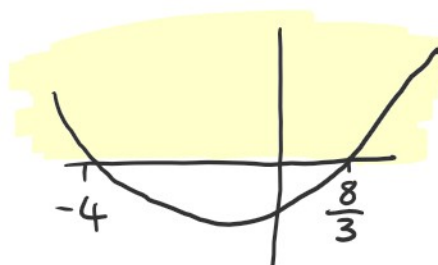
- (b) Solve the inequality $3y^2 + 4y - 32 > 0$
Show your working clearly.

$$a=3 \quad b=4 \quad c=-32$$

$$\frac{-(-4) \pm \sqrt{(-4)^2 - 4(3)(-32)}}{2(3)}$$

$$\frac{-4 + \sqrt{16 - -384}}{6}$$

$$\frac{-4 - \sqrt{16 - -384}}{6}$$



$$3y^2 + 4y - 32 > 0$$

$$y < -4$$

$$y > \frac{8}{3}$$

(3)

(Total for Question 15 is 7 marks)

FROM
FORMULA SHEET

The quadratic equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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P 7 3 9 9 4 A 0 1 5 2 8

15

- (b) Solve the inequality $2y^2 - 7y - 30 \leq 0$
Show your working clearly.

$$a=2 \quad b=-7 \quad c=-30$$

$$\frac{-(-7) \pm \sqrt{(-7)^2 - 4(2)(-30)}}{2(2)}$$

$$\frac{7 + \sqrt{49 - -240}}{4}$$

**FROM
FORMULA SHEET**

The quadratic equation

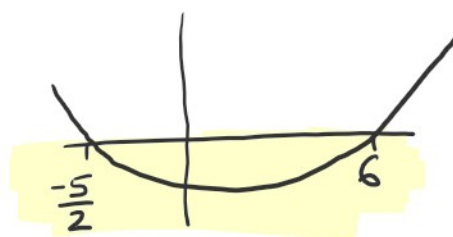
The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{7 - \sqrt{49 - -240}}{4}$$

$$\frac{7 + \sqrt{289}}{4} = 6$$

$$\frac{7 - \sqrt{289}}{4} = -\frac{5}{2}$$



$$2y^2 - 7y - 30 \leq 0$$

$$-\frac{5}{2} \leq y \leq 6 \quad (3)$$

(Total for Question 15 is 7 marks)



P 6 8 7 9 8 R A 0 1 5 2 4

19

(b) Solve the inequality $5y^2 - 17y \leq 40$

$$5y^2 - 17y \leq 40$$

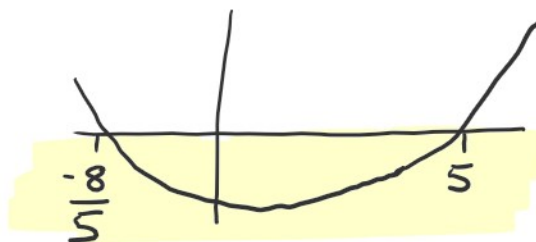
$$5y^2 - 17y - 40 \leq 0$$

$$a=5 \quad b=-17 \quad c=-40$$

$$\frac{-(-17) \pm \sqrt{(-17)^2 - 4(5)(-40)}}{2(5)}$$

$$\frac{17 + \sqrt{289 - -800}}{10}$$

$$\frac{17 - \sqrt{289 - -800}}{10}$$



$$5y^2 - 17y - 40 \leq 0$$

$$-\frac{8}{5} \leq x \leq 5$$

(3)

(Total for Question 19 is 6 marks)



- 20 Solve the inequality $10x^2 + 11x - 21 < 0$
Show clear algebraic working.

$$a = 10 \quad b = 11 \quad c = -21$$

$$\frac{-11 \pm \sqrt{(11)^2 - 4(10)(-21)}}{2(10)}$$

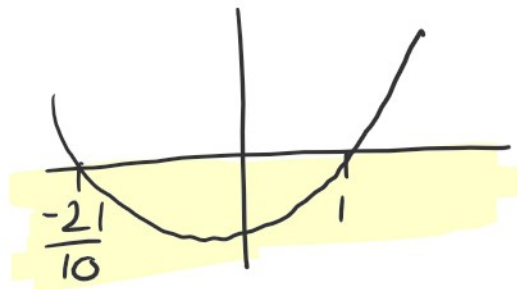
$$\frac{-11 + \sqrt{121 - -840}}{20}$$

$$\frac{-11 - \sqrt{121 - -840}}{20}$$

$$\frac{-11 + \sqrt{961}}{20}$$

$$\frac{-11 - \sqrt{961}}{20}$$

3 marks)



$$10x^2 + 11x - 21 < 0$$

$$\frac{-21}{10} < x < 1$$

FROM
FORMULA SHEET

The quadratic equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



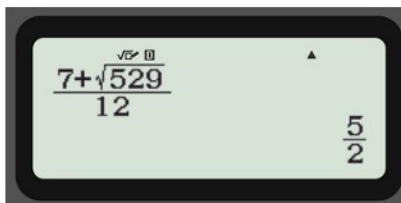
- 20 Solve $6x^2 - 7x - 20 > 0$
Show clear algebraic working.

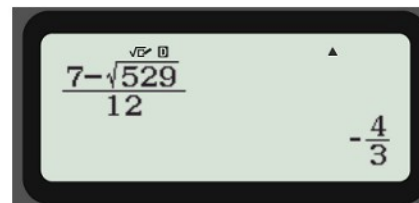
$a = 6 \quad b = -7 \quad c = -20$

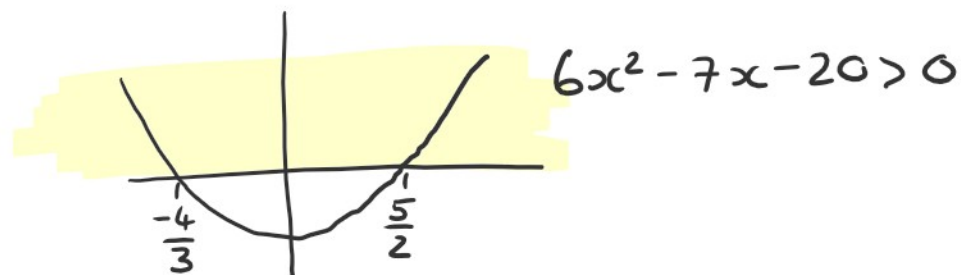
$$\frac{-(-7) \pm \sqrt{(-7)^2 - 4(6)(-20)}}{2(6)}$$

$$\frac{7 + \sqrt{49 - -480}}{12}$$

$$\frac{7 - \sqrt{49 - -480}}{12}$$







$$x < -\frac{4}{3} \quad x > \frac{5}{2}$$

(Total for Question 20 is 4 marks)

FROM
FORMULA SHEET

The quadratic equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$



- 22 Solve the inequality $6x^2 + 37x \leq 35$
Show clear algebraic working.

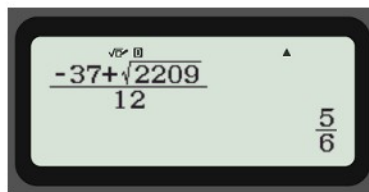
$$6x^2 + 37x \leq 35$$

$$6x^2 + 37x - 35 \leq 0$$

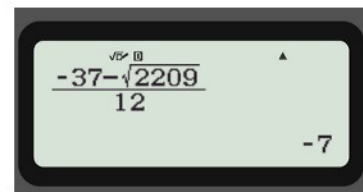
$$a=6 \quad b=37 \quad c=-35$$

$$\frac{-(37) \pm \sqrt{(37)^2 - 4(6)(-35)}}{2(6)}$$

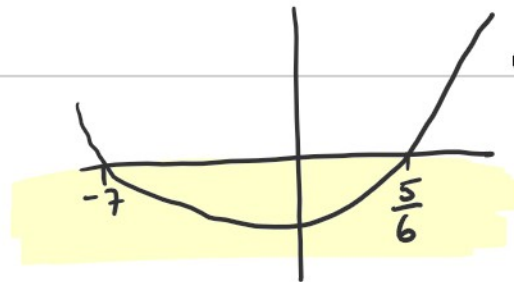
$$\frac{-37 + \sqrt{1369 - -840}}{12}$$



$$\frac{-37 - \sqrt{1369 - -840}}{12}$$



(Total for Question 22 is 3 marks)



$$6x^2 + 37x - 35 \leq 0$$

$$-7 \leq x \leq \frac{5}{6}$$

FROM FORMULA SHEET

The quadratic equation

The solutions of $ax^2 + bx + c = 0$ where $a \neq 0$ are given by:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

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