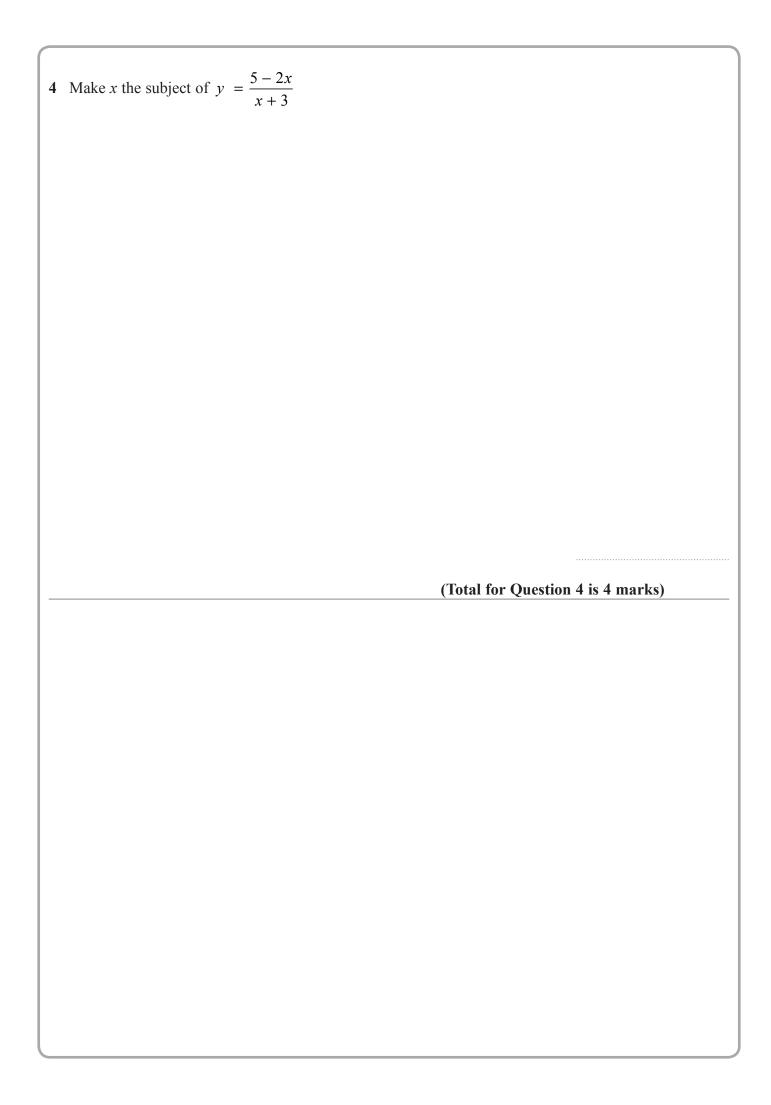
| 1 (a) Factorise $6y^2 - y - 5$   |           |
|--|-----------|
| (b) Make $f$ the subject of $w = \frac{2f + 3}{8 - f}$   | (2)       |
| (c) Express $4x^2 - 8x + 7$ in the form $a(x + b)^2 + c$ where $a, b$ and $c$ are integrated as $a(x + b)^2 + c$ | (3) gers. |
|  |           |
|  | (3)       |
| (Total for Questio   |           |

| 2 | Make $x$ the subject of the formula $y = x$ | $= \sqrt{\frac{3x-2}{x+1}}$ |                                   |  |
|---|---|-----------------------------|-----------------------------------|--|
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| _ |   |                             | (Total for Question 2 is 4 marks) |  |
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| 3 |  |
|---|--|
|   | Make x the subject of $y = \sqrt{\frac{x+1}{x-4}}$ |
|   | whate x the subject of $y - \sqrt{x-4}$            |
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| _ |           | 9a - 7 | 3a - 7 |        |
|---|-----------|--------|--------|--------|
| 5 | (a) Solve |        | 4      | = 4.55 |

Show clear algebraic working.



(b) Make c the subject of the formula  $p = \sqrt{\frac{ac + 8}{3 + c}}$ 

(4)

(Total for Question 5 is 7 marks)

6 
$$a = \frac{14}{3x - 7}$$
  $x = \frac{7}{4y - 3}$   
Express  $a$  in the form  $\frac{py + q}{ry + s}$  where  $p$ ,  $q$ ,  $r$  and  $s$  are integers. Give your answer in its simplest form.

a =

(Total for Question 6 is 3 marks)

| 7 | Given that $x = \frac{5}{9y+5}$ and that $y = \frac{5}{5a-2}$  |  |
|---|--|--|
|   | find an expression for x in terms of a.<br>Give your expression as a single fraction in its simplest form. |  |
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|   | (Total for Question 7 is 4 marks)  |  |
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Show that  $\frac{3x+6}{x^2-3x-10} \div \frac{x+5}{x^3-25x}$  simplifies to ax where a is an integer.

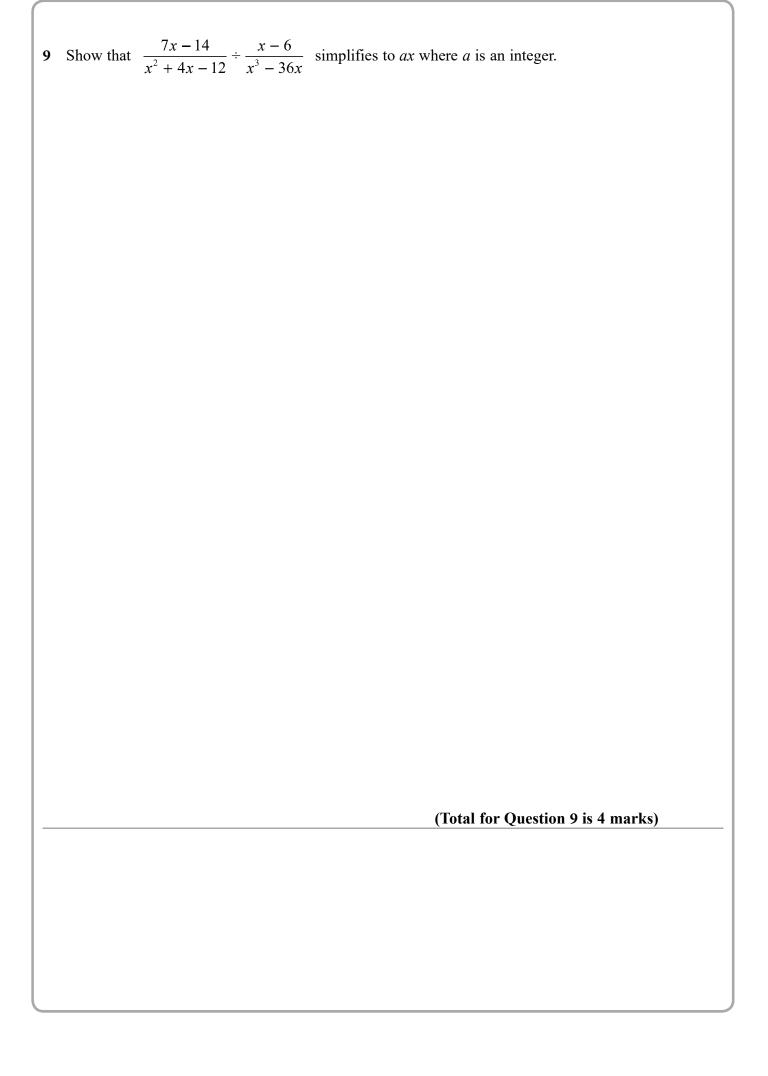
(3)

(b) Show that 
$$\frac{1}{6x^2 + 7x - 5} \div \frac{1}{4x^2 - 1}$$

where a, b, c and d are integers.

(3)

(Total for Question 8 is 6 marks)





Simplify fully  $\frac{6x^3 + 13x^2 - 5x}{4x^2 - 25}$ 

(3)

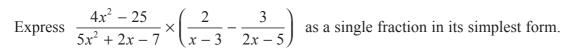
(b)

Show that  $\frac{3x+6}{x^2-3x-10} \div \frac{x+5}{x^3-25x}$  simplifies to ax where a is an integer.

(4)

(Total for Question 10 is 7 marks)





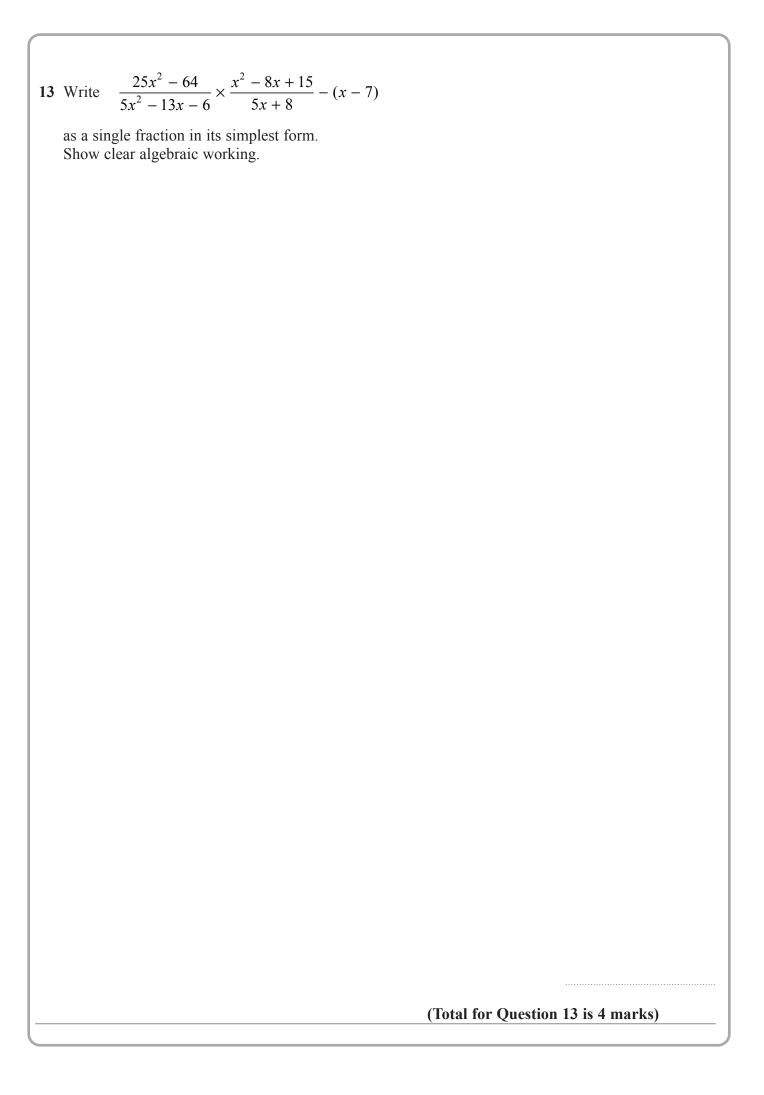
(Total for Question 10 is 4 marks)



$$\left(\frac{4}{2x-5} - \frac{3}{2x-3}\right) \div \frac{9x-4x^3}{6x^2-17x+5}$$

as a single fraction in its simplest form.

(Total for Question 12 is 4 marks)



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$$\frac{4x^2 - 17x - 15}{2x - 1} \times \frac{2x^2 - 7x + 3}{x^2 - 25} + (29 - 4x)$$

as a single fraction in its simplest form.

(Total for Question 14 is 4 marks)



$$\frac{14}{3x-21} + \left[ (x+4) \div \frac{2x^2 - 6x - 56}{2x+3} \right]$$
 in the form  $\frac{ax+b}{cx+d}$  where a, b, c and d are integers.

(Total for Question 15 is 4 marks)

16

Solve 
$$\frac{45x^3 - 80x}{3x^2 + x - 4} \times \left(\frac{1}{3x - 4} + \frac{1}{x}\right) = \frac{4(x + 2)}{5x - 8}$$

Show clear algebraic working.

 $\chi =$ 

(Total for Question 16 is 5 marks)

| 1 | 7 |
|---|---|
|   | • |

(a) Simplify fully  $\frac{10x^2 + 23x + 12}{4x^2 - 9}$ 

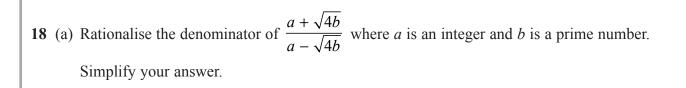
.....

(3)

$$2^{2y} \times 2^{3y+2} = \frac{8^{5y}}{4^n}$$

(b) Find an expression for *n* in terms of *y*. Show clear algebraic working and simplify your expression.

(4)



(b) Given that 
$$\left(\sqrt{\frac{y}{x}}\right)^{-5} = \frac{x^m}{y^m}$$
 where  $x \neq y$ 

find the value of m.

$$m =$$
 (1)

(3)

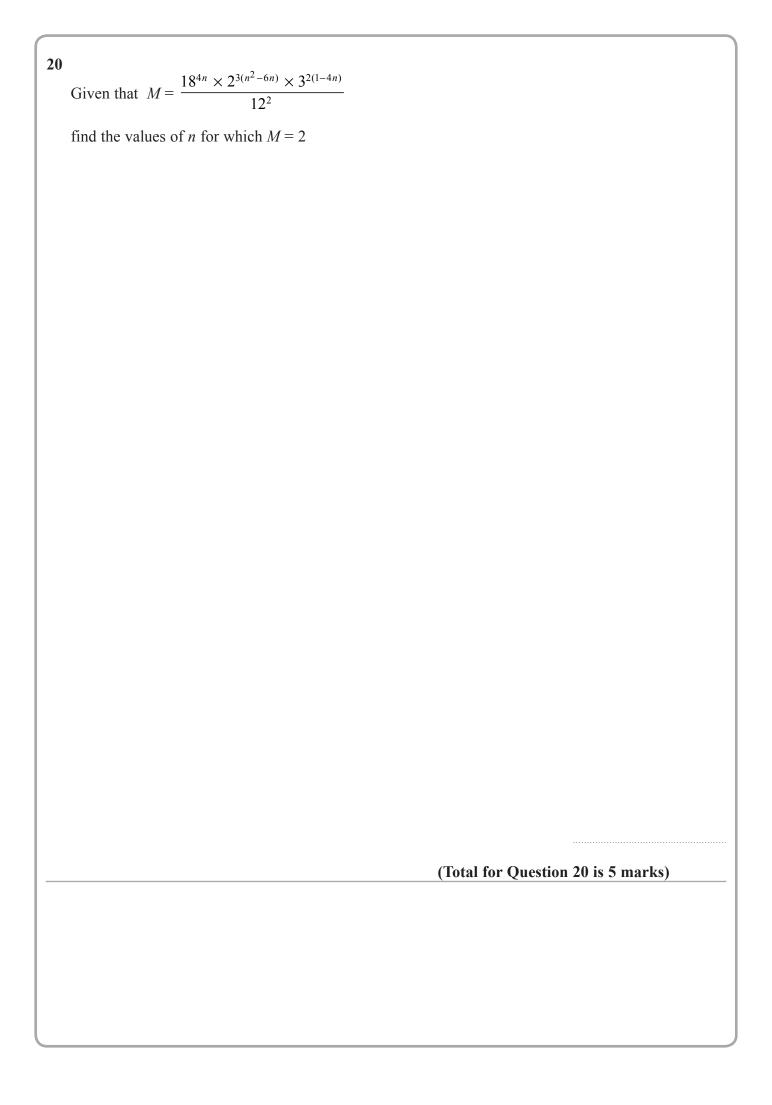
(Total for Question 18 is 4 marks)

 $\frac{18 \times \left(\sqrt{27}\right)^{4n+6}}{6 \times 9^{2n+8}} = 3^{n}$ 

Express x in terms of nShow your working clearly and simplify your expression.

 $\chi =$ 

(Total for Question 19 is 3 marks)



| 21 | Find the values of <i>n</i> such that |   |                                    |
|----|---------------------------------------|---|------------------------------------|
|    |                                       | $104n \times 23(n^2-5n) \times 52(1-5n)$                        | -2n)                               |
|    |                                       | $\frac{10^{4n} \times 2^{3(n^2 - 5n)} \times 5^{2(1-n)}}{20^2}$ | = 1                                |
|    |                                       | 20  |                                    |
|    | Show clear algebraic working.         |   |                                    |
|    |                                       |   |                                    |
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|    |                                       |   | (Total for Question 21 is 5 marks) |
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|    |                                       |   |                                    |

| <b>22</b> (a) Write $2x^2 + 16x + 35$ in the form $a(x + b)^2 + c$ where a, b, and c are in             | ntegers.  |
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|   | (3)       |
| (b) Hence, or otherwise, write down the coordinates of the turning point of to of $y = 2x^2 + 16x + 35$ | the graph |
|   |           |
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|   | (1)       |
| (Total for Question   |           |
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| q +                               | $12x - qx^2$                       |
|-----------------------------------|------------------------------------|
| an be written as $a - b(x - c)^2$ |                                    |
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|                                   | <i>a</i> =                         |
|                                   | <i>b</i> =                         |
|                                   | c =                                |
|                                   |                                    |
|                                   | (Total for Question 23 is 4 marks) |