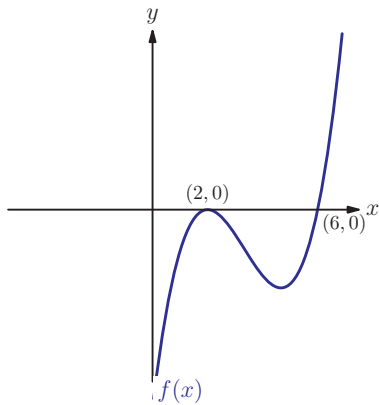


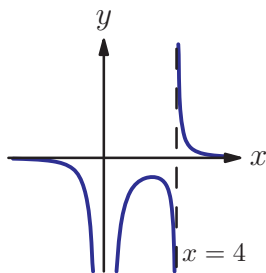
# Mixed examination practice 6

## Short questions

1. (a)



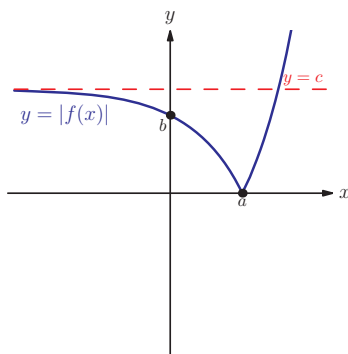
(b)



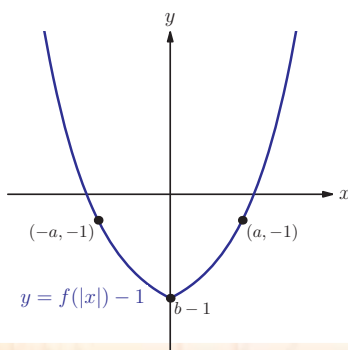
2.  $y = 2x^2 - 12x^2 + 24x - 18$

3.  $\frac{1}{3} < x < 1$

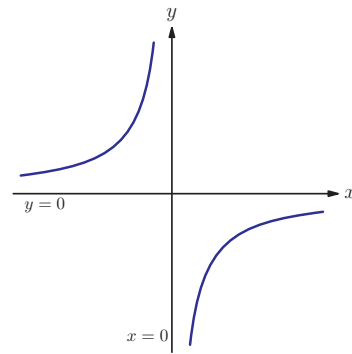
4. (a)



(b)



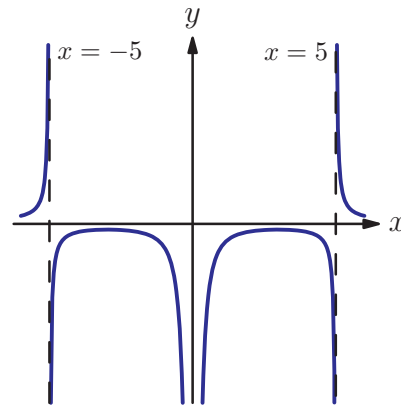
5. (a)



(b) Vertical stretch with scale factor 3 and reflection in the  $x$ -axis (or  $y$ -axis)

(c)  $f^{-1}(x) = -\frac{3}{x}$

6. (a)

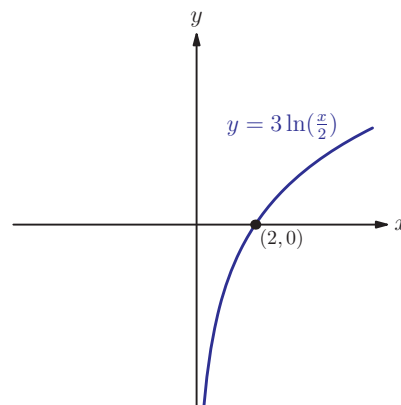


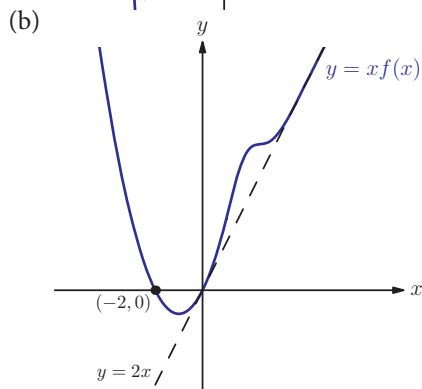
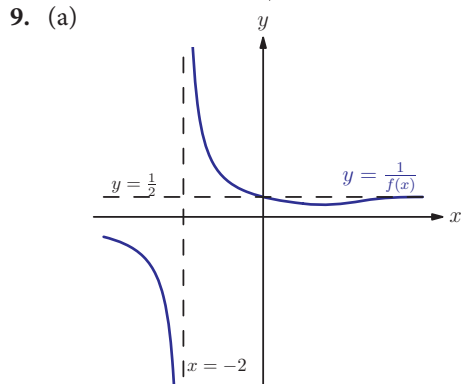
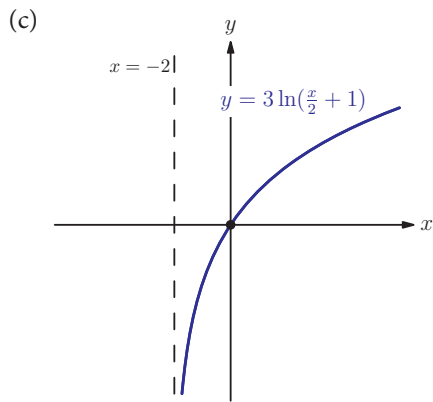
(b)  $\left(-3, -\frac{1}{5}\right), \left(3, -\frac{1}{5}\right)$

7. Translation by  $\begin{pmatrix} -3 \\ 0 \end{pmatrix}$  and vertical stretch with scale factor (sf)3.

8. (a) Horizontal stretch with sf 2; vertical stretch with sf 3

(b)

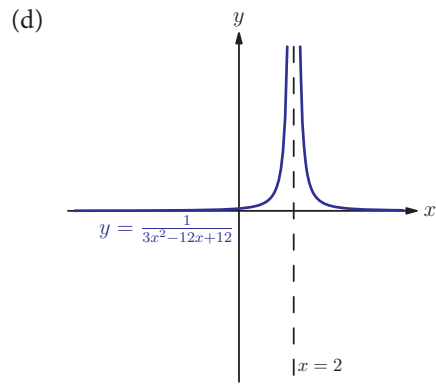




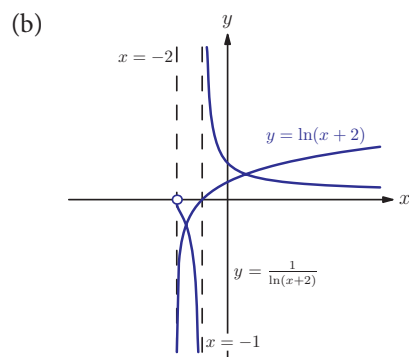
10.  $x \geq 0$

### Long questions

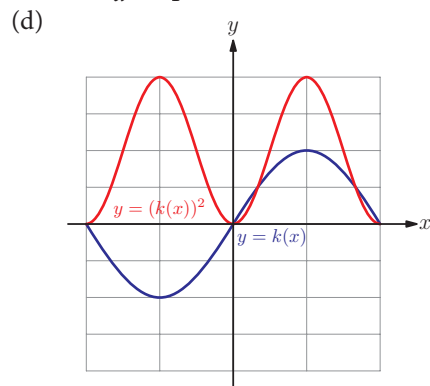
1. (a) Translation by  $\begin{pmatrix} 2 \\ 0 \end{pmatrix}$  and vertical stretch with sf 3.
- (b) Translation by  $\begin{pmatrix} 3 \\ 0 \end{pmatrix}$  and translation by  $\begin{pmatrix} 0 \\ 10 \end{pmatrix}$
- (c) Translation by  $\begin{pmatrix} 5 \\ 10 \end{pmatrix}$  and vertical stretch with scale factor 3.



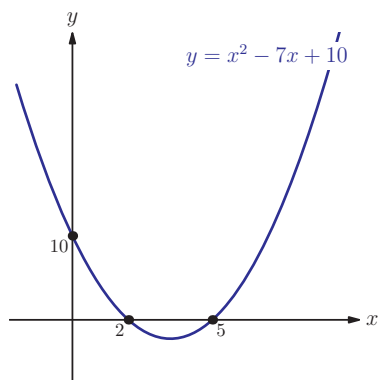
2. (a)  $y = 3$
  - (b)  $p = 3, q = 1$
  - (c) Translation with vector  $\begin{pmatrix} 2 \\ 3 \end{pmatrix}$
  - (d)  $f^{-1}(x) = \frac{2x-5}{x-3}, x \neq 3$
  - (e) Reflection in the line  $y = x$
3. (a) Translation by  $\begin{pmatrix} -2 \\ 0 \end{pmatrix}$



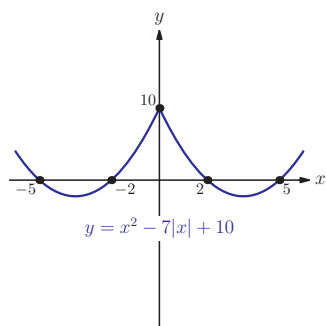
- (c) (i)  $\begin{pmatrix} 2 \\ 0 \end{pmatrix}$
- (ii)  $a = -1, b = 6, c = -10,$   
 $d = -1$



4. (a)



(c)

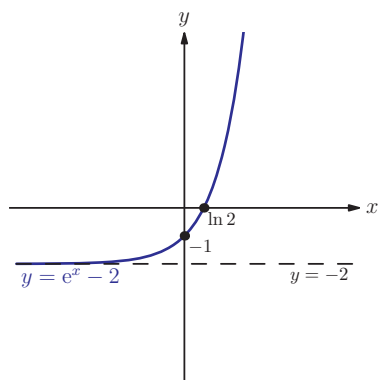


(d)  $x = \pm \frac{10}{7}$       (e)  $x = \pm 3, \pm 4$

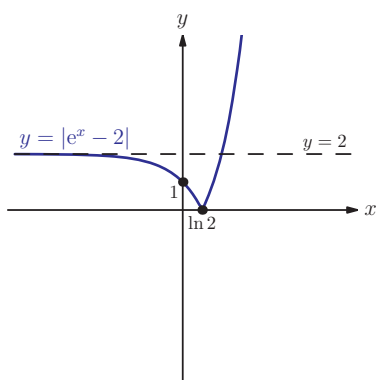
5. (a) -18      (b) 6

(c)  $p = 3, q = 17$       (d)  $x \in \mathbb{R}$

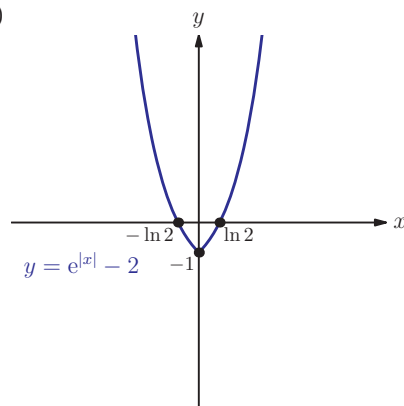
6. (a)



(b) (i)



(ii)



(c)  $x = \ln(2 - \sqrt{3}), x \geq \ln 2$

## Chapter 7

### Exercise 7A

- 3.1, 8.1, 13.1, 18.1, 23.1
    - 10, 6, 2, 2.4, -1.4, -5.2
  - 0, 1, 4, 13, 40
    - 1, -1, -19, -181, -1639
  - 2, 3, 6, 18, 108
    - $2, 1, \frac{1}{2}, \frac{1}{2}, 1$
  - 3, 4, 8, 9, 13
    - 3, 3, -5, 7, -9
  - 0, 4, 8, 12, 16
    - 13, 11, 9, 7, 5
- 5, 8, 11, 14, 17
    - 4.5, -3, -1.5, 0, 1.5
  - 0, 7, 26, 63, 124
    - 5, 20, 45, 80, 125
  - 3, 9, 27, 81, 243
    - 4, 2,  $1, \frac{1}{2}, \frac{1}{4}$
  - 1, 4, 27, 256, 3125
    - 1, 0, -1, 0, 1
- $u_{n+1} = u_n + 3, u_1 = 7$
    - $u_{n+1} = u_n - 0.8, u_1 = 7$
  - $u_{n+1} = 2u_n, u_1 = 3$
    - $u_{n+1} = 1.5u_n, u_1 = 12$