

Cartesian plane practice

Skill 5.1 Finding the gradient between two points

- Find the gradient of the line passing between these points using the graph construction method:
 - (0, 0) and (4, 5)
 - (1, 2) and (3, 8)
 - (-2, -3) and (2, 4)
 - (3, -4) and (-2, 6)
- Find the gradient of the lines passing between these points using the formula method:
 - (-3, 2) and (1, -4)
 - (10, 0) and (0, 5)
 - (-3, 0) and (1, -4)
 - (5, 2) and (6, -3)

Skill 5.2 Finding the distance between two points

- Find the distance between these points using the graph construction method:
 - (0, 0) and (2, 3)
 - (-1, 2) and (3, 5)
 - (-2, -3) and (1, 1)
- Find the distance between these points using the formula method:
 - (1, 1) and (4, 2)
 - (5, 6) and (7, 8)
 - (-2, 1) and (3, 5)

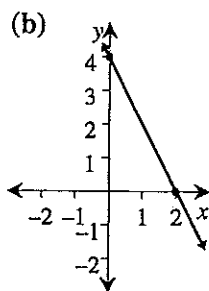
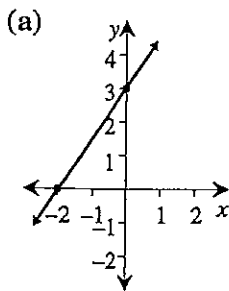
Skill 5.3 Sketching straight lines

Sketch the following straight lines by finding the x -intercept, y -intercept and selecting a checkpoint:

1 $y = x + 4$ 2 $y = 2x - 3$ 3 $x + y = -2$

Skill 5.4 Finding the equation of a straight line

- Find the equation of these lines:



- Find the equation of the lines passing through the point:
 - (-2, 4) and (2, 8)
 - (-1, -3) and (1, 2)

Skill 5.5 Simultaneous equations

Solve the following equations simultaneously and then show on a graph where they cross.

$$y = 2x + 4$$

$$y = x + 6$$

Skill 5.6 Graphing inequations

Sketch the line $y = x + 1$ and show the regions of the graph which corresponds to:

1 $y > x + 1$

2 $y \leq x + 1$

Skill 5.7 Plotting quadratic equations

Complete a table of values for the following parabolas and plot the curves on a set of axes.

1 $y = x^2 - 3$ (Use $x: -2, -1, 0, 1, 2$)

2 $y = (x - 3)^2$ (Use $x: 1, 2, 3, 4, 5$)

Skill 5.8 Shifting parabolas

For each of the following parabolas show $y = x^2$ as a reference curve and indicate the shift and/or shape change.

1 $y = 2x^2 + 1$

2 $y = -(x + 5)^2 + 2$

3 $y = 2(x - 3)^2 - 4$

Skill 5.9 Sketching parabolas

Sketch the position of the curve: $y = x^2 - 2x - 8$ by finding the x -intercept, y -intercept and turning point.

Skill 5.10 Plotting cubic equations

Generate a set of points using x -values from -2 to $+2$ for the equation: $y = 2x^3 - 4$. Use these points to plot the curve for the above equation.

Cartesian plane

Skill 5.1

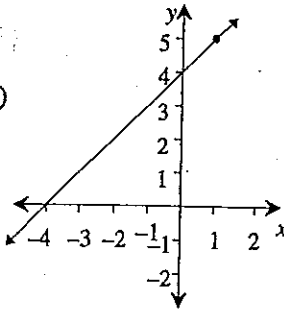
- 1 (a) $\frac{5}{4} = 1\frac{1}{4}$ (b) 3 (c) $\frac{7}{4} = 1\frac{3}{4}$
 (d) -2
 2 (a) $-\frac{3}{2} = -1\frac{1}{2}$ (b) $-\frac{1}{2}$ (c) -1
 (d) -5

Skill 5.2

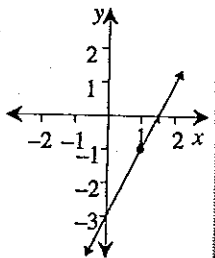
- 1 (a) 3.61 (b) 5 (c) 5
 2 (a) 3.16 (b) 2.83 (c) 6.40

Skill 5.3

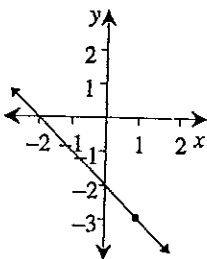
- 1 x int = -4
 y int = 4
 check point (1, 5)



- 2 x int = $1\frac{1}{2}$
 y int = -3
 check point (1, -1)



- 3 x int = -2
 y int = -2
 check point (1, -3)

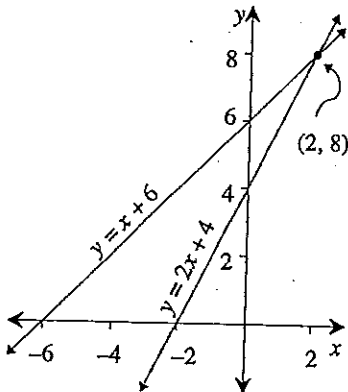


Skill 5.4

- 1 (a) $y = \frac{3x}{2} + 3$ (b) $y = -2x + 4$
 2 (a) $y = x + 6$ (b) $y = 2\frac{1}{2}x - \frac{1}{2}$

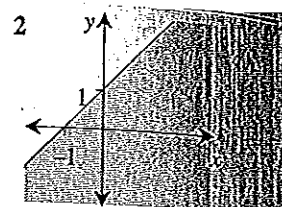
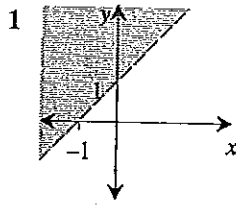
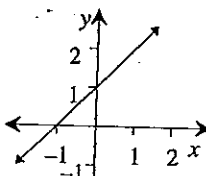
Skill 5.5

$x = 2, y = 8$

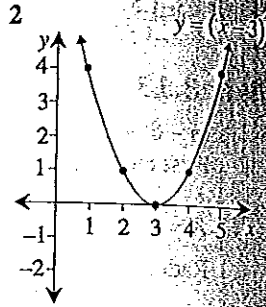
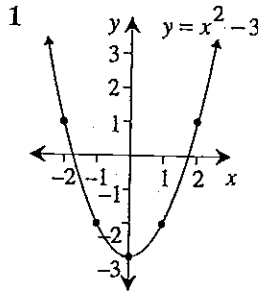


Skill 5.6

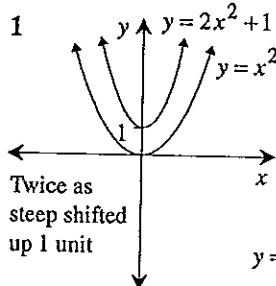
$y = x + 1$
 x int = -1
 y int = 1



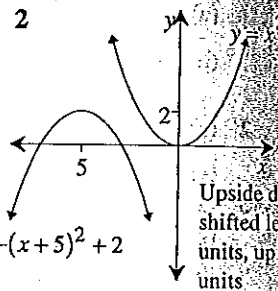
Skill 5.7



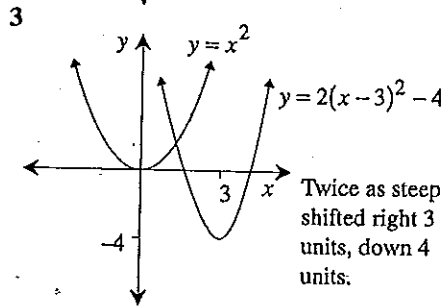
Skill 5.8



Twice as steep shifted up 1 unit



Upside down shifted left 5 units, up 2 units



Twice as steep shifted right 3 units, down 4 units.

Skill 5.9

$y = x^2 - 2x - 8$

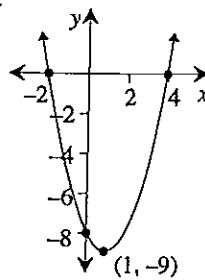
y intercept = -8

x intercept = $(x-4)(x+2) = 0$
 $x = 4, y = -2$

turning point

$$\begin{array}{r} x^2 - 2x - 8 \\ x^2 - 2x + 1 \quad -1 - 8 \\ \hline (x-1)^2 - 9 \\ (1, -9) \end{array}$$

sketch



$y = 2x^3 - 4$

Skill 5.10

x	-2	-1	0	1	2
y	-20	-6	-4	-2	12
(x, y)	(-2, -20)	(-1, -6)	(0, -4)	(1, -2)	(2, 12)

