<div style="border:1px solid;">

Algebra 6H Assessment

</div>

Higher Level   *All questions*

Clip	Grade	Title of clip	Question(s)	Marked out of	Score	%
208	8/9	Perpendicular Lines	1	4	___	__
209	8/9	Completing the Square	2 - 4	9	___	__
210	8/9	Algebraic Fractions	5 - 6	10	___	__
211	8/9	Simultaneous Equations with a Quadratic	7	4	___	__
212	8/9	Solving Quadratic Inequalities	8 - 9	7	___	__
213	8/9	Finding the nth Term of a Quadratic	10	3	___	__
214	8/9	Inverse Functions	11 - 12	7	___	__
215	8/9	Composite Functions	13 - 14	10	___	__
216	8/9	Velocity-Time Graphs	15	6	___	__

Out of 60   TOTAL SCORE _____

Final Percentage [ ] %

1) A is the point (1, -3)
   B is the point (5, 3)

   Find the equation of the line perpendicular to AB,
   passing through the midpoint of AB.
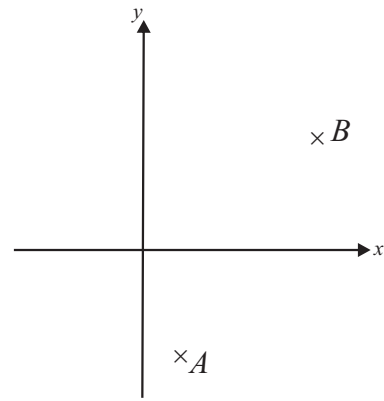
   $y = $ _____   **4**

2) a) Find the values of a and b such that $x^2 + 8x - 6 \equiv (x + a)^2 - b$

   $a = $ _____ $b = $ _____   **3**
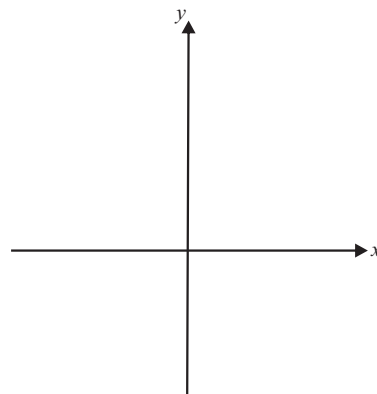
   b) Hence, or otherwise, solve the equation $x^2 + 8x - 6 = 0$,
   giving your answers in exact form.

   $x = $ _____   **2**

3) Solve the equation $2x^2 - 8x - 3 = 0$ by completing the square.
   Give your answers in exact form.

   $x = $ _____   **2**

4) Sketch the graph of $y = x^2 + 4x + 6$ showing the coordinates of the turning point
   and the coordinates of any intercepts with the coordinate axes.

   2

5) a) Show that $\dfrac{2x-1}{4}+\dfrac{x+5}{3}$ simplifies to $\dfrac{10x+17}{12}$

3

b) Hence solve $\dfrac{2x-1}{4}+\dfrac{x+5}{3}=2$

$x =$ _____ **2**

6) Solve the equation $\dfrac{7}{x+2}+\dfrac{1}{x-1}=4$

$x =$ _____ , _____ **5**

7) Solve the simultaneous equations $\quad x^2+y^2=25$
$$y=x-7$$

You must show your working.

$x =$ ___ $\quad x =$ ___
$y =$ ___ $\quad y =$ ___ **4**

8) Work out the integer values that satisfy the inequality $x^2-9x+20 \leqslant 0$

$x =$ _____ **3**

9) Solve $4x^2-9>0$

_____ , _____ **4**

10) Work out the formula for the *n*th term of the quadratic sequence

$$3 \quad 9 \quad 17 \quad 27 \quad ...$$

_____ **3**

11) Given that f(x) = 2x – 3

   a) Work out an expression for f^{-1}(x)

   _____ **2**

   b) Work out f^{-1}(7)

   _____ **1**

12) Find f^{-1}(x) where f(x) = $\dfrac{2x}{x+1}$

   _____ **4**

13) Given that f(x) = $\dfrac{x}{2}$ + 3 and g(x) = x^2

   a) Work out the value of fg(6)

   _____ **2**

   b) Work out the value of gf(10)

   _____ **2**

14) For all values of x,

   $$f(x) = 5x + 1 \text{ and } g(x) = x^2$$

   a) Work out an expression for fg(x)

   fg(x) = _____ **2**

   b) Solve fg(x) = gf(x)

   _____ , _____ **4**

15) The graph below shows the speed of a bus between two stops.
It travels for 2½ minutes.
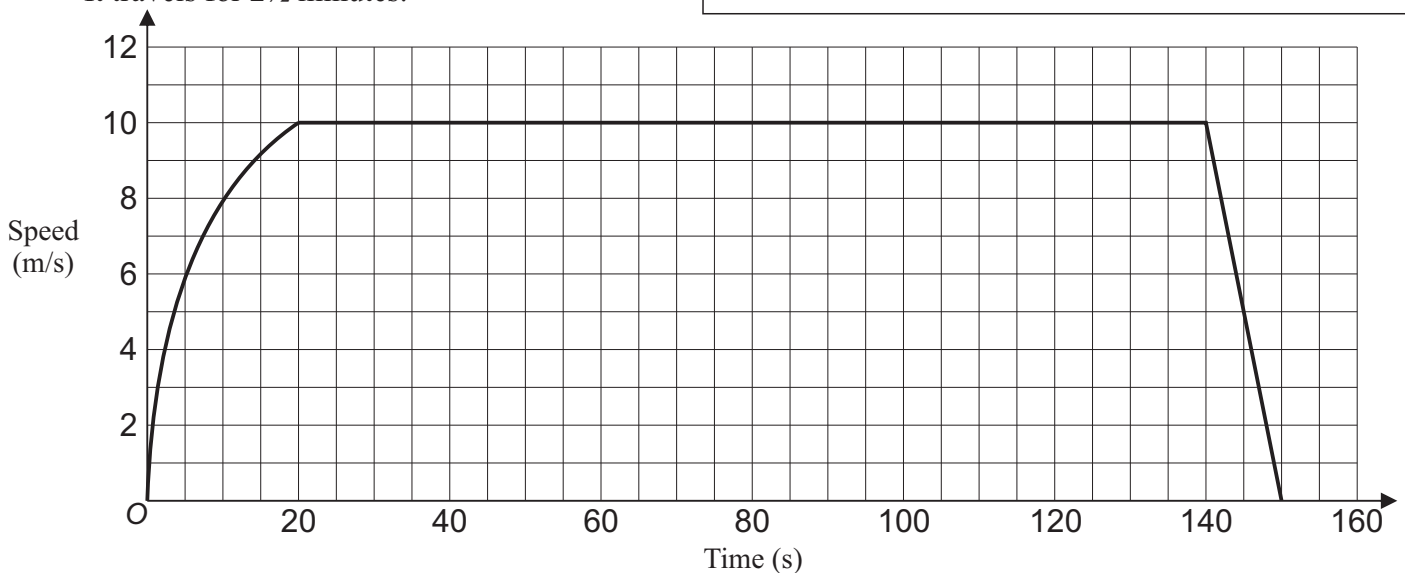
a) Estimate the acceleration of the bus at 10 s.

   _____ m/s^2 **1**

b) Describe how the motion of the bus changes after 20 s.

   1

c) The bus decelerates for the last 10 s of the motion. Work out the distance travelled whilst decelerating.

   _____ m **2**

d) Estimate the average speed of the bus for the journey.
Give your answer to 1 decimal place.

   _____ m/s **2**