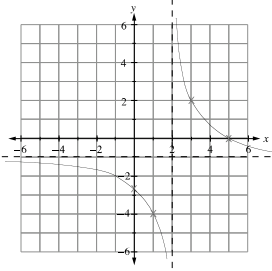
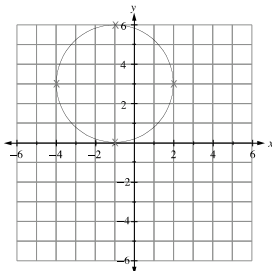
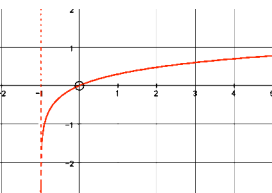
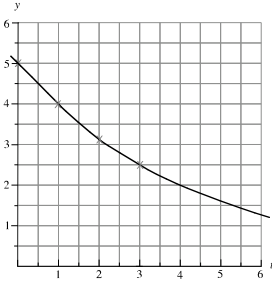


**Assessment Schedule – 2005****Mathematics: Draw straightforward non-linear graphs (90285)****Evidence Statement**

	Achievement Criteria	Q	Evidence	Code	Judgement	Sufficiency
Achievement	Draw straight-forward non-linear graphs.	1(a)		A	Correct shape and smoothly drawn through vertex $(-1, -4)$ and intercepts $(-3, 0)$ , $(1, 0)$ , $(0, -3)$	<b>Achievement:</b> $2 \times$ code A
		(b)		A	Correct shape and smoothly drawn through $(-3, 0)$ , $(-1, 0)$ , $(0, -6)$ , $(2, 0)$	
		(c)		A	Correct shape and smoothly drawn through at least one of points $(-2, 1)$ or $(-1, 2)$ and at least one of points $(1, -2)$ or $(2, -1)$  Approaches the axes asymptotically.	No repeated skills.

	Achievement Criteria	Q	Evidence	Code	Judgement	Sufficiency
Achievement with Merit	Draw non-linear graphs.  AND  Use non-linear graphs to solve problems.	1(d)		A M1	Correct shape and smoothly drawn through at least two correct points in each quadrant. At least one asymptote indicated at $x = 2$ , $y = -1$	<b>Achievement with Merit:</b> <b>EITHER</b> As for Achievement plus $4 \times$ code M1 or M2  <b>OR</b>  $3 \times$ code M1 <b>plus</b> $2 \times$ code M2.
		(e)		A M1	Correct shape and smoothly drawn through $(-4, 3)$ , $(-1, 6)$ , $(-1, 0)$ , $(2, 3)$	
		(f)		A M1	Correct shape and smoothly drawn through $(0, 0)$ . Approaches the asymptote at $x = -1$	
		2(a)	$y = (x - 2)^2 - 3$	M2	Or equivalent.	
		(b)	$y = -(x + 2)^2(x - 3)$	M2	Or equivalent.	
		3(a)		A	Correct shape and smooth continuous curve drawn through $(0, 5)$ and at least two of $(1, 4)$ , $(2, 3.2)$ etc.	
		(b)	Time = 3.1 min	M2	Allow $2.9 \leq t \leq 3.3$ or consistent with the graph.  <b>Both 3(a) and 3(b) required for M2.</b>	

	Achievement Criteria	Q	Evidence	Code	Judgement	Sufficiency
Achievement with Excellence	Determine and apply an appropriate model for a situation involving graphs.	4	<p>Equation of one parabola is</p> $y = \frac{1}{5}(x - 10)^2$ <p>Thus</p> $\frac{1}{5}(x - 10)^2 = 1.8$ $x^2 - 20x + 91 = 0$ $(x - 13)(x - 7) = 0$ $x = 13, x = 7$ <p>ignore <math>x = 7</math> as <math>x &gt; 10</math></p> <p>Hence by symmetry width = 26 m</p> <p><b>OR</b></p> <p>Join the two sides to</p> $y = kx^2$ $0.8 = k \times 4$ $k = \frac{1}{5}$ <p>Thus</p> $1.8 = \frac{1}{5}x^2$ $x^2 = 9$ $x = \pm 3$ <p>Ignore <math>x = -3</math> as <math>x</math> must be positive.</p> <p>Hence width = <math>20 + 6 = 26</math> m</p> <p><b>OR</b></p> <p>where the vertex has been assumed to be below the <math>x</math>-axis</p> $y = k(x + 10)(x - 10) + c$ <p>leading to</p> $1.8 = \frac{1}{55}(x^2 - 100)$ $x = \pm 14.11$ <p>Hence width = 28.22 m</p>	<p>M2 E</p> <p>M2 E</p>	<p>Alternative methods acceptable.</p> <p>Accept a minor error in working.</p>	<p><b>Achievement with Excellence:</b></p> <p>As for Merit <b>plus</b> Code E</p>

**Judgement Statement**

<b>Achievement</b>	<b>Achievement with Merit</b>	<b>Achievement with Excellence</b>
Draw straightforward non-linear graphs.  $2 \times A$ No repeated skills.	Draw non-linear graphs. Use non-linear graphs to solve problems.  <b>Achievement <i>plus</i></b> four of M1 <i>or</i> M2  <i>or</i>  three of M1 <i>and</i> two of M2	Determine and apply an appropriate model for a situation involving graphs.  <b>Merit <i>plus</i></b> $1 \times E$