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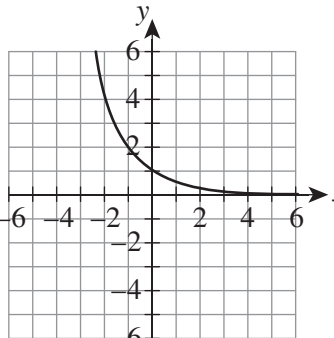
HSC Trial Examination 2020

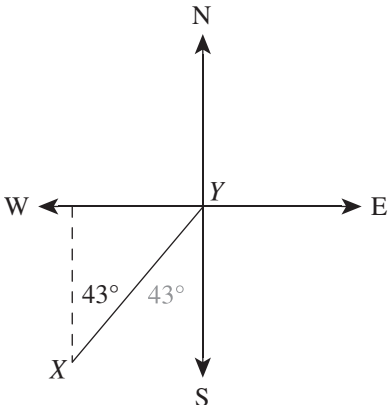
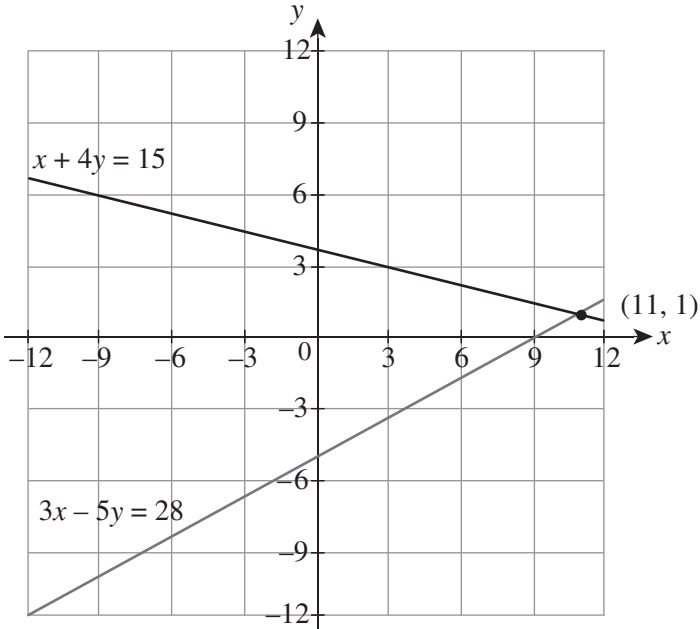
# Mathematics Standard 2

## Solutions and marking guidelines

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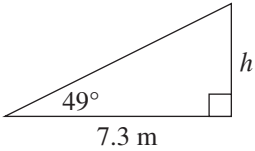
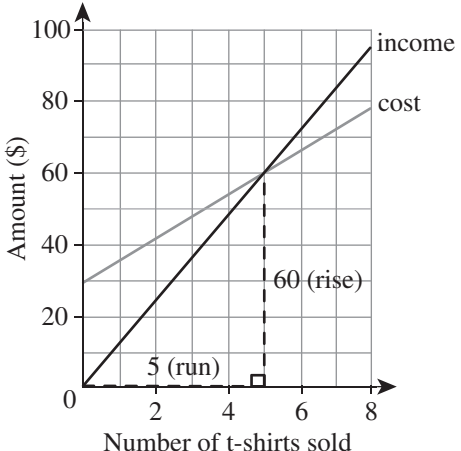


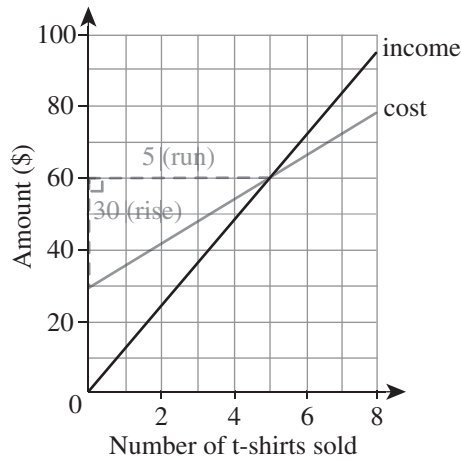
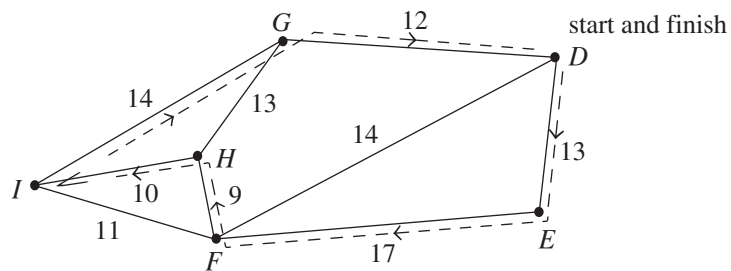
Answer and explanation	Syllabus content, outcomes and targeted performance bands															
<p><b>Question 7</b>      <b>B</b></p> $FV = PV(1 + r)^n$ $= 1600 \times \left(1 + \frac{0.08}{4}\right)^{3 \times 4}$ $\approx \$2029.19$ $I = FV - PV$ $= \$2029.19 - \$1600$ $= \$429.19$ <p>Liam will receive \$429.19 compound interest.</p>	<p>MS-F4 Investments and Loans MS2-12-5      Bands 3-4</p>															
<p><b>Question 8</b>      <b>B</b></p> <p>The relationship is a strong positive correlation (small amount of scatter and a line with a positive gradient).</p>	<p>MS-S4 Bivariate Data Analysis MS2-12-7      Bands 2-3</p>															
<p><b>Question 9</b>      <b>A</b></p> <p><math>y = 2^{-x}</math> is an exponential function. Check (0, 1) and (-1, 2) on each graph.</p> 	<p>MS-A4 Types of Relationships MS2-12-6      Bands 3-4</p>															
<p><b>Question 10</b>      <b>B</b></p> $\frac{170}{p} = \frac{10}{32}$ $10p = 5440$ $p = 544$ <p>The estimate of the parrot population is approximately 544.</p>	<p>MS-M7 Rates and Ratios MS2-12-3      Bands 4-5</p>															
<p><b>Question 11</b>      <b>C</b></p> <table border="1"> <thead> <tr> <th>Hours per week</th> <th>Class centre</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>0-4</td> <td>2</td> <td>5</td> </tr> <tr> <td>5-9</td> <td>7</td> <td>10</td> </tr> <tr> <td>10-14</td> <td>12</td> <td>3</td> </tr> <tr> <td>15-19</td> <td>17</td> <td>2</td> </tr> </tbody> </table> $\text{mean} = \frac{\sum fx}{n}$ $= \frac{2 \times 5 + 7 \times 10 + 12 \times 3 + 17 \times 2}{20}$ $= 7.5 \text{ hours}$	Hours per week	Class centre	Frequency	0-4	2	5	5-9	7	10	10-14	12	3	15-19	17	2	<p>MS-S1 Data Analysis MS-11-4      Bands 3-4</p>
Hours per week	Class centre	Frequency														
0-4	2	5														
5-9	7	10														
10-14	12	3														
15-19	17	2														

Answer and explanation	Syllabus content, outcomes and targeted performance bands
<p><b>Question 12</b>      <b>C</b></p> $r = \frac{2\%}{2} = 1\%$ $n = 2 \times 2 = 4$ <p>The intersection value is 4.0604.</p> $FV = 4.0604 \times 80\,000$ $= \$324\,832$	<p>MS–F5 Annuities MS2–12–5</p> <p style="text-align: right;">Bands 3–4</p>
<p><b>Question 13</b>      <b>D</b></p> <p>S43°W</p> 	<p>MS–M6 Non-right-angled Trigonometry MS2–12–3</p> <p style="text-align: right;">Bands 4–5</p>
<p><b>Question 14</b>      <b>A</b></p> <p>The graphs of the two equations are as follows.</p>  <p>Alternatively, substitute each answer into the equations. So <b>A</b> (11, 1):</p> $x + 4y = 15$ $11 + 4 \times 1 = 15$ $3x - 5y = 28$ $3 \times 11 - 5 \times 1 = 28$	<p>MS–A4 Types or Relationships MS2–12–6</p> <p style="text-align: right;">Bands 4–5</p>



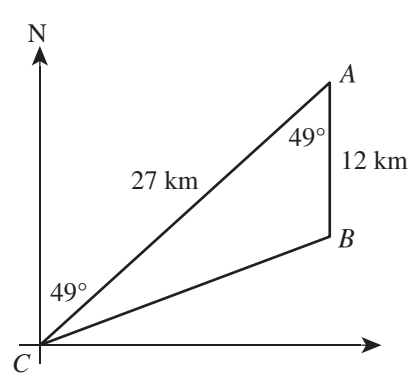
Section II

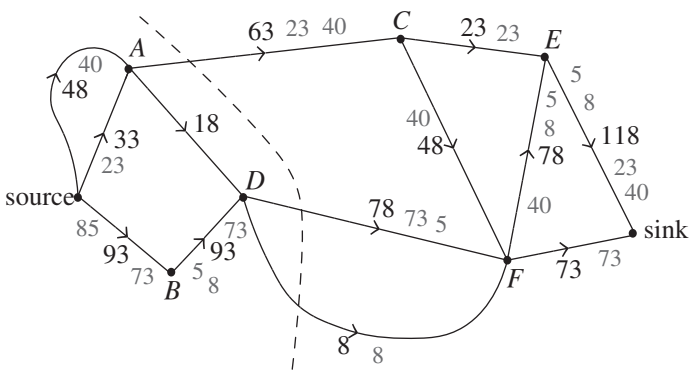
Sample answer	Syllabus content, outcomes, targeted performance bands and marking guide
<p><b>Question 16</b></p>  $\tan 49^\circ = \frac{h}{7.3}$ $h = 7.3 \times \tan 49^\circ$ $= 8.3976 \dots$ $\approx 8.4 \text{ m}$ <p>The difference in height is 8.4 metres.</p>	<p>MS–M6 Non-right-angled Trigonometry MS2–12–3 Bands 1–2</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 2</li> <li>• Shows some understanding of the problem. . . . . 1</li> </ul>
<p><b>Question 17</b></p> $V = Ah$ $= 26 \times 15 \times 0.015$ $= 5.85 \text{ m}^3$ <p>V in litres = <math>5.85 \times 1000</math></p> $= 5850 \text{ L}$ <p>The volume of water collected by the water tank is 5850 litres.</p>	<p>MS–M7 Rates and Ratios MS2–12–3 Bands 1–2</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 2</li> <li>• Finds the volume of water in cubic metres . . . . . 1</li> </ul>
<p><b>Question 18</b></p> <p>(a)</p>  $m = \frac{\text{rise}}{\text{run}} = \frac{60}{5} = 12$ <p>The y-intercept of the income received line is \$0.</p> $y = mx + c$ $I = 12n$	<p>MS–A4 Types of Relationships MS2–12–6 Bands 2–3</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>

Sample answer	Syllabus content, outcomes, targeted performance bands and marking guide
<p>(b)</p>  <p style="text-align: center;">Number of t-shirts sold</p> $m = \frac{\text{rise}}{\text{run}} = \frac{30}{5} = 6$ <p>The y-intercept of the cost line is \$30.</p> $y = mx + c$ $C = 6n + 30$	<p>MS–A4 Types of Relationships MS2–12–6 Bands 2–3</p> <ul style="list-style-type: none"> <li>• Gives the correct answer . . . . . 1</li> </ul>
<p>(c) profit = <math>(12 \times 7) - (6 \times 7 + 30)</math> = \$12</p>	<p>MS–A4 Types of Relationships MS2–12–6 Bands 2–3</p> <ul style="list-style-type: none"> <li>• Gives the correct answer . . . . . 1</li> </ul>
<p>(d) <math>n = 5</math> t-shirts (the point of intersection on the graph)</p>	<p>MS–A4 Types of Relationships MS2–12–6 Bands 1–2</p> <ul style="list-style-type: none"> <li>• Gives the correct answer . . . . . 1</li> </ul>
<b>Question 19</b>	
 <p>The shortest path is <math>D \rightarrow E \rightarrow F \rightarrow H \rightarrow I \rightarrow G \rightarrow D</math>.</p> <p>length = <math>13 + 17 + 9 + 10 + 14 + 12</math> = 75 min</p> <p>The shortest average completion time is 75 minutes.</p>	<p>MS–N2 Network Concepts MS2–12–8 Bands 4–5</p> <ul style="list-style-type: none"> <li>• Gives the correct answer . . . . . 3</li> <li>• Makes significant progress . . . . . 2</li> <li>• Shows understanding of the shortest path . . . . . 1</li> </ul>

Sample answer	Syllabus content, outcomes, targeted performance bands and marking guide
<b>Question 20</b>	
$S = V_0(1 + r)$ $= 19\,990(1 - 0.18)^4$ $= 9037.9139 \dots$ $\approx \$9038$ <p>The salvage value after four years is \$9038.</p>	MS–F4 Investments and Loans MS2–12–5 <span style="float: right;">Bands 1–2</span> • Gives the correct answer. . . . . 2 • Substitutes TWO correct values into the declining-balance formula. . . . . 1
<b>Question 21</b>	
(a) Leaking at 0.25 litres per minute, $m = -0.25$ . Initially, at $t = 0$ , $V = 10$ L. $y = mx + c$ $V = mt + c$ $= -0.25t + 10$	MS–A4 Types of Relationships MS2–12–6 <span style="float: right;">Bands 2–3</span> • Gives the correct answer. . . . . 1
(b) $t = 90$ s or 1.5 min $V = -0.25t + 10$ $= -0.25 \times 1.5 + 10$ $= 9.625$ <p>There are 9.625 litres of water remaining.</p>	MS–A4 Types of Relationships MS2–12–6 <span style="float: right;">Bands 2–3</span> • Gives the correct answer. . . . . 1
(c) All the water leaks out when $V = 0$ . $V = -0.25t + 10$ $0 = -0.25t + 10$ $0.25t = 10$ $t = 40$ <p>It would take 40 minutes for all the water to leak out.</p>	MS–A4 Types of Relationships MS2–12–6 <span style="float: right;">Bands 3–4</span> • Gives the correct answer. . . . . 2 • Shows some understanding of the problem. . . . . 1
<b>Question 22</b>	
$BAC_{\text{Female}} = \frac{10N - 7.5H}{5.5M}$ $= \frac{10 \times (2 \times 0.8 + 3 \times 1.5) - 7.5 \times 5}{5.5 \times 66}$ $= 0.0647 \dots$ $\approx 0.065$ <p>Alexis' blood alcohol content (<i>BAC</i>) at midnight is 0.065.</p>	MS–A1 Formulae and Equations MS–11–6 <span style="float: right;">Bands 2–3</span> • Gives the correct answer. . . . . 2 • Substitutes TWO correct values into the <i>BAC</i> formula . . . . . 1
<b>Question 23</b>	
(a) $t = \frac{k}{n}$ <span style="margin-left: 100px;"><math>t = \frac{21}{n}</math></span> $7 = \frac{k}{3}$ <span style="margin-left: 100px;"><math>= \frac{21}{4}</math></span> $k = 21$ <span style="margin-left: 100px;"><math>= 5.25</math> days</span> <p>It would take 5.25 days for four workers to lay the timber floor.</p>	MS–A4 Types of Relationships MS2–12–6 <span style="float: right;">Bands 3–4</span> • Gives the correct answer. . . . . 2 • Uses the sine rule with at least ONE correct value . . . . . 1

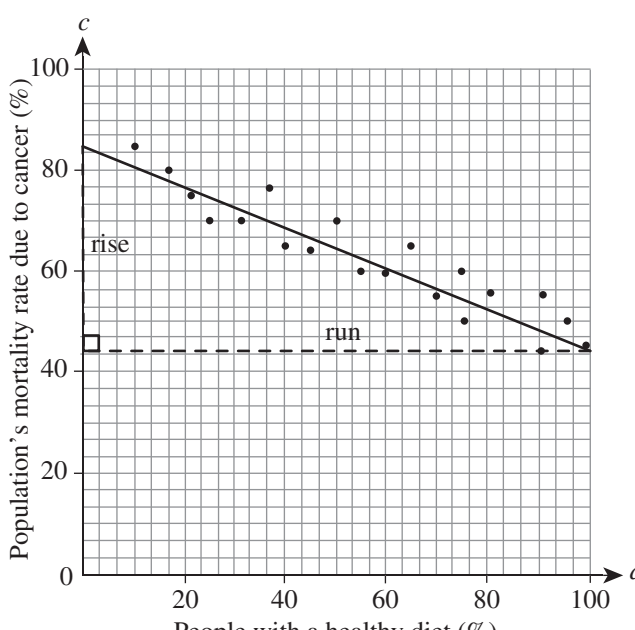


Sample answer	Syllabus content, outcomes, targeted performance bands and marking guide
<p>(b) <math>t = \frac{21}{n}</math>  <math>1 = \frac{21}{n}</math>  <math>n = 21</math> workers                      Twenty-one workers would be required to lay the timber floor in one day.</p>	<p>MS–A4 Types of Relationships                      MS2–12–6 Bands 3–4                      • Gives the correct answer . . . . . 1</p>
<b>Question 24</b>	
<p>(a) The precision or limit of reading is 100 kg.</p>	<p>MS–M1 Applications of Measurement                      MS–11–7 Bands 1–2                      • Gives the correct answer . . . . . 1</p>
<p>(b) absolute error = <math>\frac{1}{2} \times</math> precision  <math>= \frac{1}{2} \times 100</math>  <math>= 50</math> kg</p>	<p>MS–M1.1 Practicalities of measurement                      MS–11–7 Bands 2–3                      • Gives the correct answer . . . . . 1</p>
<p>(c) upper bound = measurement + absolute error  <math>= 1800 + 50</math>  <math>= 1850</math> kg                      lower bound = measurement – absolute error  <math>= 1800 - 50</math>  <math>= 1750</math> kg</p>	<p>MS–M1.1 Practicalities of measurement                      MS–11–7 Bands 2–3                      • Gives the correct answer . . . . . 1</p>
<p>(d) percentage error = <math>\pm \frac{50}{1800} \times 100</math>  <math>= \pm 2.777</math>  <math>\approx \pm 2.8\%</math></p>	<p>MS–M1.1 Practicalities of measurement                      MS–11–7 Bands 3–4                      • Gives the correct answer . . . . . 1</p>
<b>Question 25</b>	
<p>(a)</p>  <p><math>AB</math> is parallel to north direction. Therefore, <math>\angle CAB = 49^\circ</math>.                      (Alternate angles are equal when two lines are parallel.)</p>	<p>MS–M6 Non-right-angled Trigonometry                      MS2–12–3 Bands 1–2                      • Gives the correct answer . . . . . 1</p>

Sample answer	Syllabus content, outcomes, targeted performance bands and marking guide
<p>(b) <math>a^2 = b^2 + c^2 - 2bc \cos A</math>  <math>BC^2 = 27^2 + 12^2 - 2 \times 27 \times 12 \times \cos 49^\circ</math>  <math>BC = 21.1630\dots</math>  <math>\approx 21.2 \text{ km}</math>                      The distance from <math>B</math> to <math>C</math> is 21.2 km.</p>	<p>MS–M6 Non-right-angled Trigonometry                      MS2–12–3 Bands 3–4</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 2</li> <li>• Uses the cosine rule with at least ONE correct value . . . . . 1</li> </ul>
<p>(c) Use the sine rule to find <math>\angle ACB</math>.  <math>\frac{\sin \angle ACB}{12} = \frac{\sin 49^\circ}{21.1630\dots}</math>  <math>\sin \angle ACB = \frac{12 \sin 49^\circ}{21.1630\dots}</math>  <math>\angle ACB = 25.3369\dots</math>  <math>\approx 25^\circ</math>                      The true bearing of <math>B</math> from <math>C</math> is <math>074^\circ\text{T}</math> (<math>49^\circ + 25^\circ</math>).</p>	<p>MS–M6 Non-right-angled Trigonometry                      MS2–12–3 Bands 4–5</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 2</li> <li>• Uses the sine rule with at least ONE correct value . . . . . 1</li> </ul>
<b>Question 26</b>	
<p><math>N = 1000(2.1^t)</math>  <math>= 1000 \times 2.1^5</math>  <math>= 40\,841.01</math>  <math>\approx 40\,841</math>                      After five years, the population of the town is 40 841.</p>	<p>MS–4 Types of relationships                      MS2–12–6 Bands 1–2</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>
<b>Question 27</b>	
<p>(a) inflow for vertex <math>E = 23 + 78 = 101 \text{ L}</math>                      possible outflow for vertex <math>E = 118 \text{ L}</math>                      The inflow is less than the possible outflow.                      Therefore, the outflow for vertex <math>E</math> is 101 L.</p>	<p>MS–N3 Critical Path Analysis                      MS2–12–8 Bands 3–4</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>
<p>(b)</p>  <p>The diagram shows a network flow problem. Nodes are source, A, B, C, D, E, F, and sink. Edges and their flow values: source to A (40), source to B (85), source to D (93), A to B (33), A to C (63), A to D (18), B to D (73), C to E (23), C to F (40), D to E (23), D to F (78), E to sink (5), F to sink (73), F to E (8), F to sink (73), E to sink (118). A dashed line represents a minimum cut separating the source from the sink.</p>	<p>MS–N3 Critical Path Analysis                      MS2–12–8 Bands 4–5</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 2</li> <li>• Shows some understanding of the problem. . . . . 1</li> </ul>
<p>(c) Maximum flow equals the minimum cut.                      maximum flow = <math>63 + 78 + 8</math>  <math>= 149 \text{ L}</math>                      The maximum flow of the network is 149 litres.</p>	<p>MS–N3 Critical Path Analysis                      MS2–12–8 Bands 3–4</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>

Sample answer	Syllabus content, outcomes, targeted performance bands and marking guide
<b>Question 28</b>	
maximum heart rate (MHR) = $220 - \text{age (years)}$ $= 220 - 18.25$ $= 201.75$  heart rate when Maya begins exercising = $0.58 \times 201.75$ $= 117.015$ $\approx 117 \text{ bpm}$  Maya's heart rate is estimated to be 117 bpm when she begins exercising.	MS–M7 Rates and Ratios MS–11–8 <span style="float: right;">Bands 2–3</span> • Gives the correct answer . . . . . 2  • Finds the MHR. . . . . 1
<b>Question 29</b>	
daily interest rate = $\frac{15.7}{365}$ $= 0.043013\dots$ $\approx 0.0430\%$  interest = $1240 \times 0.0403 \times 12$ $= 6.4004\dots$ $\approx \$6.40$  total paid = $1240 + 6.40$ $= \$1246.40$  The total amount paid is \$1246.40.	MS–F4 Investments and Loans MS2–12–5 <span style="float: right;">Bands 3–4</span> • Gives the correct answer . . . . . 3  • Calculates the interest . . . . . 2  • Shows some understanding of the problem . . . . . 1
<b>Question 30</b>	
expected frequency = $np$ $= 0.6 \times 200$ $= 120 \text{ seeds}$	MS–S2 Relative Frequency and Probability MS–11–8 <span style="float: right;">Bands 2–3</span> • Gives the correct answer . . . . . 2  • Shows some understanding of the problem . . . . . 1
<b>Question 31</b>	
(a) The intersection value is 3.7908 (10% and 5 years). $PV = 3.7908 \times 15\,000$ $= \$56\,862$	MS–F5 Annuities MS2–12–5 <span style="float: right;">Bands 1–2</span> • Gives the correct answer . . . . . 1
(b) The intersection value is 3.9020 (1% and 4 years). $PV = 3.9020 \times 10\,000$ $= \$39\,020$	MS–F5 Annuities MS2–12–5 <span style="float: right;">Bands 3–4</span> • Gives the correct answer . . . . . 1
(c) The intersection value is 2.5771 (8% and 3 years). $52\,217 = x \times 2.5771$ $x = \frac{52\,217}{2.5771}$ $= 20\,261.9223\dots$ $\approx \$20\,262$  The value of the annuity is \$20 262 per year.	MS–F5 Annuities MS2–12–5 <span style="float: right;">Bands 4–5</span> • Gives the correct answer . . . . . 1

Sample answer	Syllabus content, outcomes, targeted performance bands and marking guide
<b>Question 32</b>	
$\begin{aligned} \text{time} &= \frac{4000 \text{ L}}{5 \text{ min}} \\ &= 800 \text{ min} \\ &= \frac{800}{60} \text{ h} \\ &= 13.3333\dots\text{h} \\ &= 13 \text{ h } 20 \text{ min} \end{aligned}$ <p>The tank will be emptied in 13 hours 20 minutes.</p>	MS–M7 Rates and Ratios MS2–12–3 <span style="float: right;">Bands 2–3</span> • Gives the correct answer. . . . . 2 • Shows some understanding of the problem. . . . . 1
<b>Question 33</b>	
(a) <div style="text-align: center; margin: 10px 0;"> <pre>                     graph LR                     Tens --- U1[4]                     Tens --- U2[5]                     Tens --- U3[3]                     Tens --- U4[5]                     Tens --- U5[3]                     Tens --- U6[4]                     </pre> </div> <p>The sample space is {34, 35, 43, 45, 53, 54}.</p>	MS–S2 Relative Frequency and Probability MS–11–8 <span style="float: right;">Bands 3–4</span> • Gives the correct answer. . . . . 2 • Constructs ONE stage of the tree diagram correctly OR lists the sample space . . . . . 1
(b) $P(55) = 0$ (Numbers are not repeated.)	MS–S2 Relative Frequency and Probability MS–11–8 <span style="float: right;">Bands 1–2</span> • Gives the correct answer. . . . . 1
(c) $P(35) = \frac{n(35)}{n(S)} = \frac{1}{6}$	MS–S2 Relative Frequency and Probability MS–11–8 <span style="float: right;">Bands 2–3</span> • Gives the correct answer. . . . . 1
(d) The sample space is {33, 34, 35, 43, 44, 45, 53, 54, 55}. $P(35) = \frac{1}{9}$	MS–S2 Relative Frequency and Probability MS–11–8 <span style="float: right;">Bands 3–4</span> • Gives the correct answer. . . . . 1
<b>Question 34</b>	
$\begin{aligned} c &= \bar{y} - m\bar{x} \\ &= 85 - 0.4 \times 60 \\ &= 61 \end{aligned}$ <p>The y-intercept is 61.</p>	MS–S4 Bivariate Data Analysis MS2–12–7 <span style="float: right;">Bands 3–4</span> • Gives the correct answer. . . . . 1
<b>Question 35</b>	
(a) The standard deviation is 10 kg.	MS–S5 The Normal Distribution MS2–12–7 <span style="float: right;">Bands 2–3</span> • Gives the correct answer. . . . . 1
(b) Sixty-eight percent of scores have a z-score between –1 and 1 (or from 60 kg to 80 kg). $\text{region A} = \frac{68\%}{2} = 34\%$	MS–S5 The Normal Distribution MS2–12–7 <span style="float: right;">Bands 3–4</span> • Gives the correct answer. . . . . 1

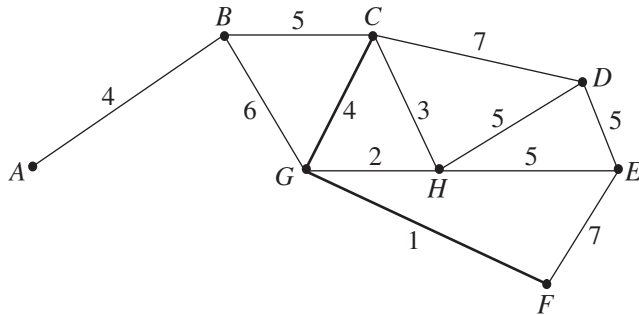
Sample answer	Syllabus content, outcomes, targeted performance bands and marking guide
<p>(c) A student with a <math>z</math>-score of <math>-2</math> is two standard deviations below the mean <math>70 - (2 \times 10) = 50</math>. The weight of the student would be 50 kg.</p>	<p>MS–S5 The Normal Distribution MS2–12–7 Bands 3–4 • Gives the correct answer . . . . . 1</p>
<p>(d) <math>z = \frac{x - \bar{x}}{s} = \frac{100 - 70}{10} = 3</math> The percentage of scores less than a <math>z</math>-score of 3 is 99.85%. number of students = <math>99.85\% \times 500</math> <math>= 499.25</math> <math>= 499</math> There are 499 students with a mass less than 100 kg.</p>	<p>MS–S5 The Normal Distribution MS2–12–7 Bands 5–6 • Gives the correct answer . . . . . 2 • Finds the <math>z</math>-score OR shows some understanding of the problem . . . . . 1</p>
<b>Question 36</b>	
<p>(a)</p>  <p><math>m = \frac{\text{rise}}{\text{run}}</math> <math>= -\frac{40}{100}</math> <math>= -0.4</math> The gradient is <math>-0.4</math></p>	<p>MS–S4 Bivariate Data Analysis MS2–12–7 Bands 2–3 • Gives the correct answer . . . . . 1</p>
<p>(b) The <math>y</math>-intercept is 85. <math>y = mx + c</math> <math>c = -0.4d + 85</math></p>	<p>MS–S4 Bivariate Data Analysis MS2–12–7 Bands 3–4 • Gives the correct answer . . . . . 1</p>
<p>(c) The correlation coefficient is approximately <math>-0.8</math> (small amount of scatter and a line with a negative gradient). <i>Note: Any value between <math>-0.9</math> and <math>-0.7</math> is acceptable.</i></p>	<p>MS–S4 Bivariate Data Analysis MS2–12–7 Bands 1–2 • Gives the correct answer . . . . . 1</p>



Sample answer

Syllabus content, outcomes, targeted performance bands and marking guide

(c)



shortest distance =  $4 + 1$   
 $= 5$  km

The shortest distance to travel from C to F is 5 km.

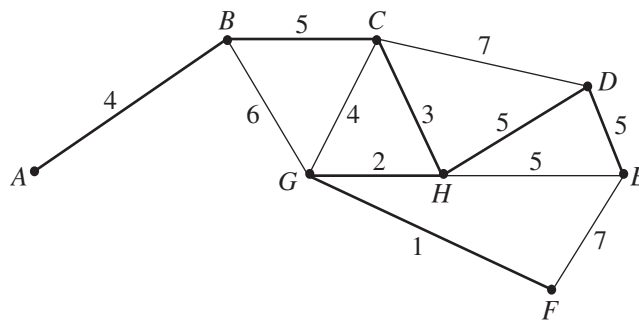
MS-N3 Critical path analysis

MS2-12-3

Bands 4-5

- Gives the correct answer ..... 1

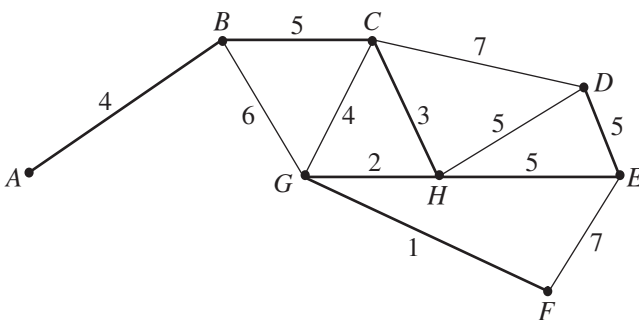
(d)



length =  $4 + 5 + 3 + 2 + 1 + 5 + 5$   
 $= 25$  km

The length of the spanning tree is 25 km.

Note: The following is an alternative solution.



MS-N3 Critical path analysis

MS2-12-3

Bands 5-6

- Gives the correct answer ..... 3

- Finds the minimum spanning tree ..... 2

- Calculates the correct length from an incorrect spanning tree ..... 1

Question 41

(a)

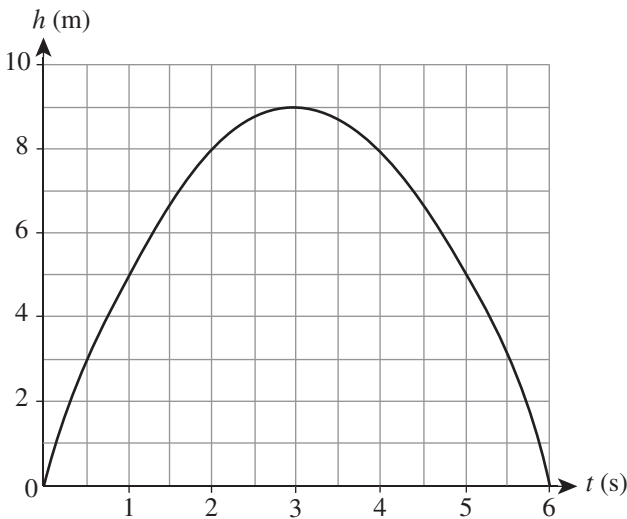
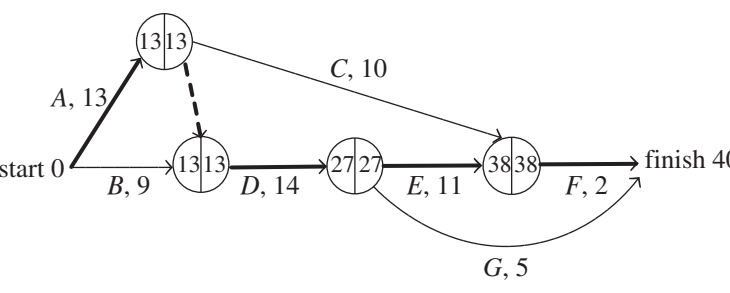
$t$	0	1	2	3	4	5	6
$h$	0	5	8	9	8	5	0

MS-A4 Types of Relationships

MS2-12-6

Bands 3-4

- Gives the correct answer ..... 1

Sample answer	Syllabus content, outcomes, targeted performance bands and marking guide
<p>(b)</p> 	<p>MS–A4 Types of Relationships MS2–12–6 Bands 3–4</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>
<p>(c) From the graph, the maximum height reached is 9 metres.</p>	<p>MS–A4 Types of Relationships MS2–12–6 Bands 2–3</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>
<p>(d) From the graph, the maximum height is reached at 3 seconds.</p>	<p>MS–A4 Types of Relationships MS2–12–6 Bands 2–3</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>
<b>Question 42</b>	
<p>(a) electricity = <math>160 \times 24 \times 7</math>  <math>= 26\,880</math> Wh  <math>= 26.88</math> kWh  <math>\approx 27</math> kWh</p> <p>The refrigerator uses 27 kWh.</p>	<p>MS–M7 Rates and Ratios MS2–12–3 Bands 1–2</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>
<p>(b) cost = <math>26.88 \times 0.41</math>  <math>= 11.0208</math>  <math>\approx \\$11.02</math></p> <p>The cost of using the refrigerator is \$11.02.</p>	<p>MS–M7 Rates and Ratios MS2–12–3 Bands 3–4</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>
<b>Question 43</b>	
<p>(a)</p> 	<p>MS–N3 Critical Path Analysis MS2–12–8 Bands 5–6</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 2</li> <li>• Connects THREE vertices correctly OR equivalent merit . . . . . 1</li> </ul>
<p>(b) The minimum time for the project is 40 hours.</p>	<p>MS–N3 Critical Path Analysis MS2–12–8 Bands 4–5</p> <ul style="list-style-type: none"> <li>• Gives the correct answer. . . . . 1</li> </ul>



<b>Sample answer</b>	<b>Syllabus content, outcomes, targeted performance bands and marking guide</b>
<p>(c) float time = LST – EST  <math>= 35 - 27</math>  <math>= 8 \text{ h}</math>                      The float time for activity <i>G</i> is 8 hours.</p>	<p>MS–N3 Critical Path Analysis                      MS2–12–8 Bands 4–5                      • Gives the correct answer . . . . . 1</p>