**MAT1372 Solution to p. 229 #27**

Let X be the random variable which represents the number of Christmas trees sold.

1. If the nursery purchases 1200 Christmas trees, the probability distribution for the number of Christmas trees sold is:

|  |  |
| --- | --- |
| x (number of trees sold)  Maximum number of trees that can be sold is 1200. | P(x) |
| 1200 | 0.5 |
| 1200 | 0.2 |
| 1200 | 0.3 |
|  |  |

Expected number of trees sold: E[X] = 1200\*0.5 + 1200\*0.2 +1200\*0.3 = 1200

Expected profit: 1200 \*$20 – 1200 \* $6 = $16800

1. If the nursery purchases 1500 Christmas trees, the probability distribution for the number of Christmas trees sold is:

Maximum number of trees that can be sold is 1500.

|  |  |
| --- | --- |
| x (number of trees sold) | P(x) |
| 1200 | 0.5 |
| 1500 | 0.2 |
| 1500 | 0.3 |
|  |  |

Expected number of trees sold: E[X] = 1200\*0.5 + 1500\*0.2 +1500\*0.3 = 1350

Expected profit: 1350 \*$20 – 1500 \* $6 = $18000

1. If the nursery purchases 1800 Christmas trees, the probability distribution for the number of Christmas trees sold is:

Maximum number of trees that can be sold is 1800.

|  |  |
| --- | --- |
| x (number of trees sold) | P(x) |
| 1200 | 0.5 |
| 1500 | 0.2 |
| 1800 | 0.3 |
|  |  |

Expected number of trees sold: E[X] = 1200\*0.5 + 1500\*0.2 +1800\*0.3 = 1440

Expected profit: 1440 \*$20 – 1800 \* $6 = $18000