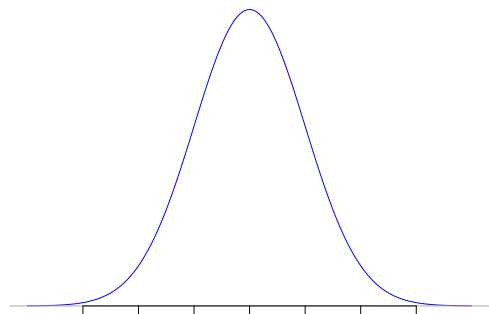


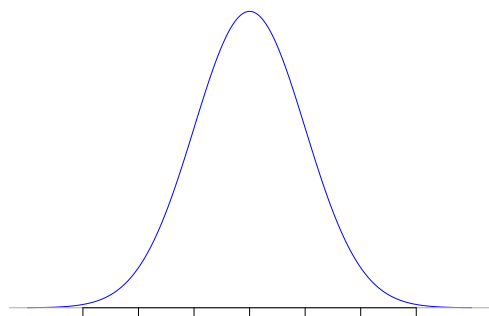
**Worksheet: Normal Distributions and Z-scores**

1. In each case (i) label the tick marks of the density curve for  $N(0, 1)$ ; (ii) sketch the area under the curve corresponding to the proportion given; and (iii) determine this proportion using technology or the tables.

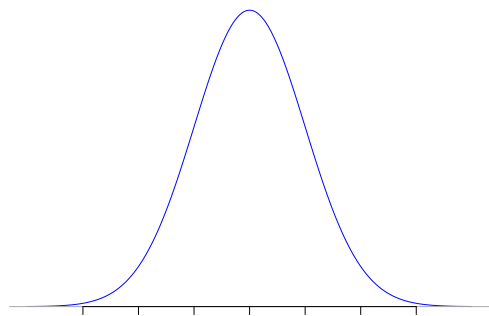
(a)  $P(z < 1.12)$



(b)  $P(z > 0.94)$

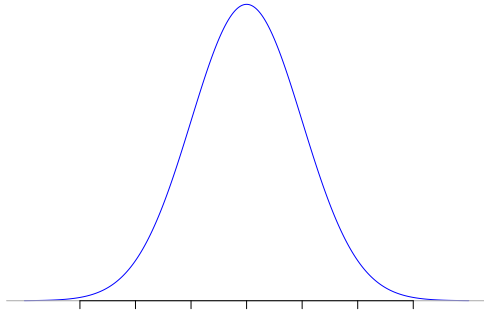


(c)  $P(1 < z < 2.5)$

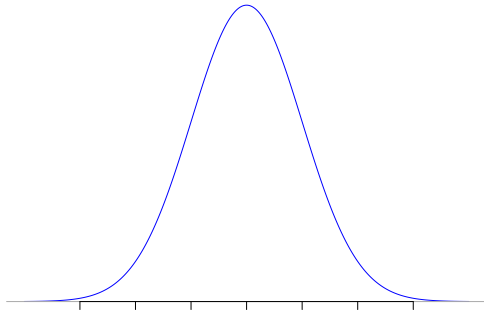


2. In each case (i) label the tick marks of the density curve for the given normal distribution  $N(\mu, \sigma)$ , (ii) sketch the area under the curve corresponding to the proportion given; (iii) convert to  $z$ -scores; and (iv) determine the proportion using technology or the tables.

(a) In  $N(14, 4)$ , find  $P(X > 16.4)$

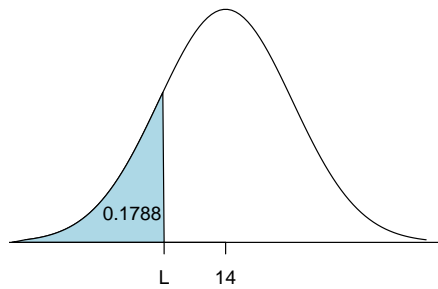


(b) In  $N(10, 3)$ , find  $P(8 < X < 11)$



3. The household income in a certain community is normally distributed with a mean of \$58,000 and a standard deviation of \$10,000. Determine the proportion of households with incomes exceeding \$70,000.

4. Find the value  $L$  for which the area under the normal distribution  $N(14, 4)$  to the left of  $L$  is 0.1788, as pictured below.



5. Scores on a test are normally distributed with mean 78 and standard deviation 6. How high must you score to be in the top 5% of all scores?
6. The time it takes Ralph to commute to work has a normal distribution, with a mean of 23 minutes and a standard deviation of 2.5 minutes. On 95% of occasions the commute time takes less than what amount?