

Practise, Apply, Solve 7.4U, page 591

- vertices: (0, 3) and (0, -3), major axis: 6, minor axis: 4
 - vertices: (5, 0) and (-5, 0), major axis: 10, minor axis: 8
 - vertices: (7, 0) and (-7, 0), major axis: 14, minor axis: 6
 - vertices: (7, 0) and (-7, 0), major axis: 14, minor axis: 8
 - vertices: (0, 10) and (0, -10), major axis: 20, minor axis: 10
 - vertices: (9, 0) and (-9, 0), major axis: 18, minor axis: 16
- centre: (2, 0), major axis (horizontal): 6, minor axis: 4
 - centre: (-1, 3), major axis (horizontal): 10, minor axis: 2
 - centre: (3, -4), major axis (horizontal): 20, minor axis: 8
 - centre: (1, -2), major axis (vertical): 4, minor axis: $2\sqrt{2}$
 - centre: (-1, -1), major axis (vertical): 16, minor axis: 8
 - centre: (-3, 4), major axis (horizontal): 6, minor axis: 4
- major axis: 12, minor axis: 8, foci: (0, $2\sqrt{5}$) and (0, $-2\sqrt{5}$); centre: (0, 0), vertices: (0, 6) and (0, -6)
 - major axis: 12, minor axis: $6\sqrt{2}$, foci: (0, $3\sqrt{2}$) and (0, $-3\sqrt{2}$); centre: (0, 0), vertices: (0, 6) and (0, -6)
 - major axis: $4\sqrt{3}$, minor axis: $4\sqrt{2}$, foci: (0, 2) and (0, -2); centre: (0, 0), vertices: (0, $2\sqrt{3}$) and (0, $-2\sqrt{3}$)
 - major axis: $12\sqrt{2}$, minor axis: 6, foci: ($3\sqrt{7}$, 0) and ($-3\sqrt{7}$, 0), centre: (0, 0), vertices: ($\sqrt{72}$, 0) and ($-\sqrt{72}$, 0)
 - major axis: 8, minor axis: 4, foci: ($2\sqrt{3}$, 0) and ($-2\sqrt{3}$, 0); centre: (0, 0), vertices: (-4, 0) and (4, 0)
 - major axis: 10, minor axis: 4, foci: (0, $\sqrt{21}$) and (0, $-\sqrt{21}$); centre: (0, 0), vertices: (0, 5) and (0, -5)
- $\frac{x^2}{9} + \frac{y^2}{20.25} = 1$
 - $\frac{x^2}{25} + \frac{y^2}{9} = 1$
 - $\frac{x^2}{100} + \frac{y^2}{36} = 1$
 - $\frac{x^2}{28} + \frac{y^2}{64} = 1$
 - centre: (1, 0), major axis (vertical): 6, minor axis: 4
 - centre: (2, 0), major axis (horizontal): 6, minor axis: 4
 - centre: (0, 0), major axis (vertical): 12, minor axis: $6\sqrt{2}$
 - centre: (-3, 1), major axis (horizontal): 20, minor axis: 14
 - centre: (0, 3), major axis (vertical): $4\sqrt{10}$, minor axis: 8
 - centre: (1, 0), major axis (horizontal): 6, minor axis: 2
- vertices: (0, 4), (0, -4); major axis: 8, minor axis: 6; foci: (0, $\sqrt{7}$), (0, $-\sqrt{7}$); equation: $\frac{x^2}{9} + \frac{y^2}{16} = 1$, $D = \{x | -3 \leq x \leq 3, x \in \mathbf{R}\}$, $R = \{y | -4 \leq y \leq 4, y \in \mathbf{R}\}$
 - vertices: (6, 0), (-6, 0); major axis: 12, minor axis: 10; foci: ($\sqrt{11}$, 0), ($-\sqrt{11}$, 0); equation: $\frac{x^2}{36} + \frac{y^2}{25} = 1$; $D = \{x | -6 \leq x \leq 6, x \in \mathbf{R}\}$, $R = \{y | -5 \leq y \leq 5, y \in \mathbf{R}\}$
- vertices: (0, 8), (0, -8); major axis: 16, minor axis: 12; foci: (0, $2\sqrt{7}$), (0, $-2\sqrt{7}$); equation: $\frac{x^2}{36} + \frac{y^2}{64} = 1$; $D = \{x | -6 \leq x \leq 6, x \in \mathbf{R}\}$, $R = \{y | -8 \leq y \leq 8, y \in \mathbf{R}\}$
 - vertices: (4, 0), (-4, 0); major axis: 8, minor axis: 4; foci: ($2\sqrt{3}$, 0), ($-2\sqrt{3}$, 0); equation: $\frac{x^2}{16} + \frac{y^2}{4} = 1$; $D = \{x | -4 \leq x \leq 4, x \in \mathbf{R}\}$, $R = \{y | -2 \leq y \leq 2, y \in \mathbf{R}\}$
- The ellipse will be very wide and not very tall. The major axis is 100 units long and the minor axis is about 20 units long.
- centre: (2, -1), major axis: 8, minor axis: 4
 - centre: (-1, -2), major axis: 8, minor axis: $2\sqrt{2}$
 - centre: (-1, 2), major axis: 8, minor axis: $2\sqrt{3}$
 - centre: (0, 3), major axis: $2\sqrt{40}$ or $4\sqrt{10}$, minor axis: 8
- $y = \pm\sqrt{32 - x^2}$
 - $y = \pm 3\sqrt{1 - \frac{x^2}{5}}$
 - $y = \pm\sqrt{-4x^2 + 8x + 12}$
- $\frac{x^2}{169} + \frac{y^2}{144} = 1$
- $\frac{x^2}{9} + \frac{y^2}{25} = 1$
- 2.996×10^8 km
 - $\frac{x^2}{2.2500 \times 10^{16}} + \frac{y^2}{2.2493 \times 10^{16}} = 1$
- The equation is $\frac{x^2}{6} + \frac{y^2}{12} = 1$.
- The running area is an ellipse 8 m wide and $4\sqrt{3}$ m high.
- $x^2 + \frac{(y-1)^2}{4} = 1$
 - $\frac{(x-1)^2}{9} + \frac{(y+1)^2}{4} = 1$
 - $\frac{(x-2)^2}{4} + \frac{(y+1)^2}{16} = 1$
 - $\frac{x^2}{9} + \frac{(y+5)^2}{16} = 1$
- $D = \{x | -5 \leq x \leq 5, x \in \mathbf{R}\}$, $R = \{y | -3 \leq y \leq 3, y \in \mathbf{R}\}$
 - $D = \{x | -4 \leq x \leq 4, x \in \mathbf{R}\}$, $R = \{y | -6 \leq y \leq 6, y \in \mathbf{R}\}$
 - $D = \{x | -5 \leq x \leq 5, x \in \mathbf{R}\}$, $R = \{y | -2 \leq y \leq 2, y \in \mathbf{R}\}$
 - $D = \{x | -3 \leq x \leq 3, x \in \mathbf{R}\}$, $R = \{y | -4 \leq y \leq 4, y \in \mathbf{R}\}$
 - $D = \{x | -4 \leq x \leq 4, x \in \mathbf{R}\}$, $R = \{y | -2 \leq y \leq 2, y \in \mathbf{R}\}$
 - $D = \{x | -7 \leq x \leq 5, x \in \mathbf{R}\}$, $R = \{y | -1 \leq y \leq 3, y \in \mathbf{R}\}$
- $\frac{x^2}{90} + \frac{y^2}{10} = 1$
- A circle is an ellipse with both foci at the centre. The length of the major and minor axes is the length of the diameter of the circle. The circle could also satisfy the locus definition of the ellipse.
- The driver's truck will just fit under the arch.
- Yes, points (40, 120) and (60, 80) both lie within the ellipse.