[15] 1. Answer each of the following questions by checking one or more of the corresponding boxes. Some questions may require you to check more than one box in order to create the most complete and correct statement.

(a) Compared to the graph of $y = \sqrt{x}$, the graph of $y = \sqrt{5 - x}$ has undergone which of the following?

- ☐ a vertical reflection
- ☐ a horizontal reflection
- ☐ a horizontal translation to the right
- ☐ a horizontal translation to the left
- ☐ a vertical skewing

(b) Compared to the graph of $y = |x|$, the graph of $y = -3|x| + 2$ has undergone which of the following?

- ☐ a vertical reflection
- ☐ a horizontal reflection
- ☐ a vertical translation upwards
- ☐ a vertical translation downwards
- ☐ a vertical skewing

(c) Identify the equation of the axis of symmetry of the quadratic function $f(x) = (x+3)^2 - 4$.

- ☐ $x = 3$
- ☐ $x = -3$
- ☐ $y = 4$
- ☐ $y = -4$
- ☐ $y = x$

(d) In radians, what is the measure of a 160° angle?

- ☐ $\frac{\pi}{160}$
- ☐ $\frac{9\pi}{4}$
- ☐ $\frac{9\pi}{8}$
- ☐ $\frac{4\pi}{9}$
- ☐ $\frac{8\pi}{9}$

(e) If θ is an angle for which $\sin(\theta) < 0$ and $\cot(\theta) < 0$, in what quadrant does θ lie?

- ☐ first quadrant
- ☐ second quadrant
- ☐ third quadrant
- ☐ fourth quadrant
- ☐ θ must lie on the x- or y-axes

[10] 2. For each of the following, identify an angle θ which meets the given criteria. Give the angle in degrees and in radians.

(a) θ is in the first quadrant and $\sin(\theta) = \frac{1}{2}$

(b) θ is in the first quadrant and $\tan(\theta) = \sqrt{3}$

(c) θ is in the fourth quadrant and $\cos(\theta) = \frac{\sqrt{3}}{2}$

(d) θ is in the second quadrant and $\tan(\theta) = -1$

(e) $\sin(\theta) = 1$

[4] 3. A car drives up a long, steep hill. The angle of elevation of the hill is $35°$. From the bottom of the hill to the top, the car travels 500 metres. How high is the hill? Round your answer to the nearest metre.

[6] 4. If θ is an angle in the second quadrant for which $\sin(\theta) = \frac{3}{5}$, determine the other five trigonometric ratios of θ.

[5] 5. Verify the identity $\dfrac{1}{\cos(x)\csc^2(x)} = \sec(x) - \cos(x)$.