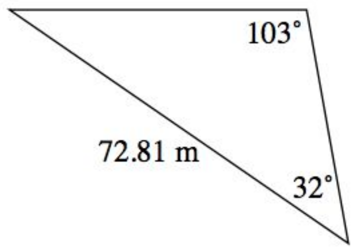
1. **(SP5.7, SP5.8 - N) (CI)** A fair six-sided dice has a "1" on one face, has a 2 on two of its faces and has a 3 on three of its faces. The dice is thrown twice. The random variable, T, represents the total score resulting from the two dice being thrown.
(Cirrito 16.3, p545)

   a. Find $P(T = 3)$ and explain what the answer means in the context of the problem.
   b. Prepare a probability distribution table for this "experiment".
   c. Find the probability that the total score is more than 4.

2. (**T3.6 - R**) (**CA**) The diagram shows a triangular building lot. The distance are given in meters. Find the perimeter and area of this lot, giving your answers correct to the nearest hundredth.
(Cirrito 9.5.1, p290)



3. (**C6.1 - N**) (**CA**) Use calculator to draw tangent lines to following functions at the given points. For each function, include a sketch of the function with the tangent line, write down the equation of the tangent line, the slope of tangent as well as the meaning of the tangent line with respect to the function at that given point.
(Cirrito 18.3, p591)

   a. The function $f(x) = 2x^2 + x - 1$ at $x = 3$
   b. The function $g(x) = \sin(x)$ at $x = \frac{\pi}{4}$
   c. The function $h(x) = 2e^x + 1$ at $x = \ln(3)$

4. (**C6.1 - N**) (**CA**) Determine the value of the following "limits" ⇒ i.e. determine the limiting value of $f(x)$ as per $\lim_{x\to\infty} f(x)$, where $f(x)$ is:

   a. Let $f(x) = \frac{2x-1}{x+3}$, so in other words, evaluate $\lim_{x\to\infty} \frac{2x-1}{x+3}$.
   b. Let $f(x) = 20\left(\frac{3}{4}\right)^x$, so in other words, evaluate $\lim_{x\to\infty} 20\left(\frac{3}{4}\right)^x$.
   c. Let $f(x) = 2x^3 - x$, so in other words, evaluate $\lim_{x\to\infty} 2x^3 - x$.
   d. Let $f(x) = \tan^{-1}(x)$, so in other words, evaluate $\lim_{x\to\infty} \tan^{-1}(x)$

5. **(T3.5 - E) (CI) SKILL**: Quadratic Trig Equations & Identities. Each of these equations involves a double angle. Solve for x on the domain of $0 \le x \le 2\pi$:
(Cirrito 10.2.2, p332)

   a. $\sin(2x) - \cos(x) = 0$ b. $\sin(x) - \cos(2x) = 0$

6. **(F2.6, F2.8, C6.1 - R,N)** **(CA)** We know from experience as consumers that the demand for a product tends to decrease as the price increases. This "fact" can be represented by a **demand function**. The demand function for a particular product is given by $p(x) = 500 - \frac{3}{5}e^{0.0004x}$, where *p* is the price per unit and *x* is total demand in number of units. ***(Cirrito 7.2, p210)***

   a. Find the price, *p*, to the nearest dollar for a demand of:
      i. 1000 units ii. 5000 units iii. 10,000 units
   b. Sketch a graph of the demand function
   c. What level of production will produce a price per unit of $200?
   d. Determine the value of $\lim_{x\to\infty} p(x)$ and interpret the meaning of this limiting value.
   e. Use your calculator to draw the tangent line to the function at *x* = 15,000 and interpret the meaning of the slope of the tangent line.

7. (**T3.4 - R,N**) (**CA**) Given the function $f(x) = \tan(2x)$,
   (Cirrito 16.3.2, p341)

   a. Graph $g(x) = \tan(x)$ as well as the function $f(x) = \tan(2x)$ on the domain of $\{-\pi \le x \le \pi\}$
   b. Sketch the graph of *g* into your notebooks.
   c. How are the two graphs related?
   d. Find *x* intercept(s) of *f* (x), given the domain $\{-\pi \le x \le \pi\}$.
   e. Find the equation(s) of the asymptotes of *f* (*x*).
   f. State the applied transformations of the parent function, $g(x) = \tan(x)$.

8. **(CI)** Given the function $P(x) = x^3 - 3x^2 - 9x + 5$,

   a. Find the equation of the **slope function** of *P*(*x*) (henceforth, we will call this the **derivative function**)
   b. Determine the slope of the curve of *P*(*x*) at *x* = 2 and at *x* = 0 and at *x* = 4.
   c. At what points do you expect the slope of the function to be 0?
   d. What could be happening on the function at a point where it's slope is 0?
   e. Use DESMOS to graph the function and sketch the function into your notebooks. On what domain does the function increase? How is this related to your answers to Q8b? Where does the function have its extrema? How is this related to your answers to Q8c?

   f.