Question 1:
Suppose Q = {-3, 5, $\frac{1}{3}$, $\sqrt{20}$, $\frac{0}{5}$, 0.125, $\frac{6}{0}$, $\sqrt{81}$, $\frac{21}{7}$, 2π }

Part 1: Find the sum of all the integers in set Q

Part 2: Find the product of all the natural numbers in set Q

Part 3: Find the largest irrational number in set Q

Part 4: Find the number of whole numbers in set Q

Question 2:
Suppose $w = -2, x = -1, y = \frac{1}{3}$, and $z = 3$. Evaluate the following

Part 1: $z^2 - w^2 + y^2 - 2^w$

Part 2: $\frac{(wy)^3}{(-w-y)^z}$

Part 3: $|y - z| - |z - w|$

Part 4: $z^w + y^x - w^z + x^w$

Question 3:
Perform the following conversions:

Part 1: Convert 2 days into seconds.

Part 2: Convert 5 yards into inches.

Part 3: Convert 20 km into cm.

Part 4: Convert 3 gallons into cups.

Question 4:
If $100x^2 - 40x + 4 = (ax + b)^2$ and $3x^3 - 12x^2 - x + 4 = (cx^2 + d)(ex + f)$. Find the following.

Part 1: abc

Part 2: $a + b + c + d + e + f$

Part 3: $\frac{bc}{ef}$

Part 4: $a^b + c^d$

Question 5:
Simplify each rational expression. Assume all variables are positive.

Part 1: $\sqrt{\frac{x^3}{16}} + x\sqrt{\frac{9x}{25}} + \sqrt{\frac{81x^3}{4}}$

Part 2: $\frac{\sqrt[3]{45}\cdot\sqrt[3]{25}}{\sqrt[3]{3}}$

Part 3: $\frac{\sqrt{5}}{\sqrt{4x}}$

Part 4: $\frac{\sqrt{3}}{\sqrt{6}+\sqrt{3}}$

Question 6:
Use the following functions to evaluate.
$f(x) = 3x^2, g(x) = x - 2, h(x) = \frac{1}{x}, j(x) = x^2 + 6x - 16$

Part 1: $h(4) - f(-2)$

Part 2: $\frac{j(-1)\cdot h(2)}{f(3)}$

Part 3: $f(g(-2)) + g(h(-3))$

Part 4: $g\left(f\left(h\left(j(0)\right)\right)\right)$

Question 7:
Write each of the linear equations with the given information in **standard form**, where the coefficient of *x* is the smallest possible whole number.

Part 1: The line with a slope of $^3/_5$ and passing through the point $(-2, 7)$.

Part 2: The line passing though the points $(9, -1)$ and $(-2, 5)$.

Part 3: The line perpendicular to the line in Part 1 and passing through the point $(4, 0)$.

Part 4: The line passing through $(3, 1)$ and the midpoint of the line segment with endpoints $(-4, 5)$ and $(6, -7)$

Question 8:
Solve each equation.

Part 1: $3(x-1)-(2x-2)=\frac{2}{3}(6x-12)$

Part 2: $\frac{3x-4}{5}=\frac{-2x-1}{3}$

Part 3: $2x^2=9x-9$

Part 4: $\sqrt{x-3}+3=\sqrt{3x+4}$

Question 9:
For each expression find the sum of the coefficients of the expanded form.

Part 1: $(2x-4)^2$

Part 2: $9(-x+\frac{2}{3})^2$

Part 3: $(x+5)^3$

Part 4: $(2x-1)(x+3)(x^2+4x-4)$

Question 10:
Solve each problem.

Part 1: The quotient of a number and three, decreased by nine is two thirds of the sum of the number and one. Find the number.

Part 2: Together Bill and Bob can clean the entire kitchen in 5 hours if they work together. Working by himself, it would take Bill 9 hours to complete the job. How long would it take Bob to clean the entire kitchen by himself? (Give answer in hours and minutes if necessary)

Part 3: The product of two consecutive odds integers is 79 more than their sum. What is the sum of all the integers?

Part 4: A rope measuring 55 feet is cut into 3 pieces. The second piece is 6 times the length of the first piece and the third piece is two-thirds the length of the second piece. Find the difference in length between the longest and shortest piece.

Question 11: Consider the following functions, $f(x) = \frac{1}{2}x + 3$, $g(x) = -\frac{4}{x}$, $h(x) = x^2 - 2$.

Part 1: Find the point(s) of intersection of *f(x)* and *g(x).*

Part 2: Find *f(x) ÷ g(x)*

Part 3: Find the product of *f(x), g(x). and h(x)*

Part 4: Find *h(f(g(x)))*

Question 12: Solve.

Part 1: Solve the system $\begin{cases} 4x + 3y = 1 \\ -6x - 2y = -9 \end{cases}$, write the answer as (a, b)

Part 2: Solve the system $\begin{cases} 3x + 8y = -1 \\ -8x + 8y = 10 \end{cases}$, write the answer as (c, d)

Part 3: Find $ad - bc$

Part 4: Find $\frac{c-a}{b-d}$

Question 13: Find the units digit for each number

Part 1: 5^{21}

Part 2: 7^{8}

Part 3: 3^{35}

Part 4: 9^{2001}

Question 14:
Consider the functions $f(x) = x^2 - 4x - 5$ and $g(x) = -x^2 + 8x + 4$

Part 1: Find the positive difference of the x-coordinates of the x-intercepts of *f(x).*

Part 2: Find the sum of the y-coordinates of the y-intercepts of *f(x)* and *g(x).*

Part 3: Find the product of the coordinates of the vertex of *f(x).*

Part 4: Find the product of the coordinates of the vertex of *g(x).*