1) Evaluate each of the following.

a) $-\frac{3}{5}+\frac{9}{10}$

$$=-\frac{\mathbf{6}}{\mathbf{10}}+\frac{\mathbf{9}}{\mathbf{10}}$$
$$=\frac{\mathbf{3}}{\mathbf{10}}$$

b) $-1\frac{5}{8}-2\frac{3}{4}$

$$=-\frac{\mathbf{13}}{\mathbf{8}}-\frac{\mathbf{11}}{\mathbf{4}}$$
$$=-\frac{\mathbf{13}}{\mathbf{8}}-\frac{\mathbf{22}}{\mathbf{8}}$$
$$=-\frac{\mathbf{35}}{\mathbf{8}}\left(\mathbf{or}\ -\mathbf{4}\frac{\mathbf{3}}{\mathbf{8}}\right)$$

c) $\left(\frac{3}{4}\right)\left(-2\frac{5}{6}\right)$

$$=\left(\frac{\mathbf{3}}{\mathbf{4}}\right)\left(-\frac{\mathbf{17}}{\mathbf{6}}\right)$$
$$=-\frac{\mathbf{51}}{\mathbf{24}}$$
$$=-\frac{\mathbf{17}}{\mathbf{8}}\left(\mathbf{or}\ -\mathbf{2}\frac{\mathbf{1}}{\mathbf{8}}\right)$$

d) $\left(-\frac{4}{7}\right)\div\left(-\frac{5}{9}\right)$

$$=\left(-\frac{\mathbf{4}}{\mathbf{7}}\right)\left(-\frac{\mathbf{9}}{\mathbf{5}}\right)$$
$$=\frac{\mathbf{36}}{\mathbf{35}}\left(\mathbf{or}\ \mathbf{1}\frac{\mathbf{1}}{\mathbf{35}}\right)$$

2) A baker uses $3\frac{1}{3}$ cups of flour to make 5 batches of cookies. If another baker only wants to make one batch, how much flour should they use?

$$3\frac{\mathbf{1}}{\mathbf{3}}\div\mathbf{5}$$
$$=\frac{\mathbf{10}}{\mathbf{3}}\div\frac{\mathbf{5}}{\mathbf{1}}$$
$$=\frac{\mathbf{10}}{\mathbf{3}}\times\frac{\mathbf{1}}{\mathbf{5}}$$
$$=\frac{\mathbf{10}}{\mathbf{15}}$$
$$=\frac{\mathbf{2}}{\mathbf{3}}$$

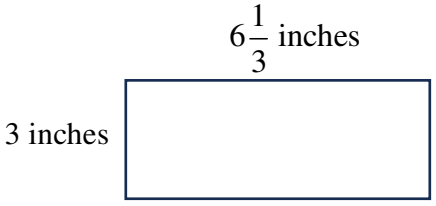
$\therefore$ the baker should use $\frac{2}{3}$ of a cup of flour for one batch.

3) There were initially $24\frac{1}{2}$ crates of tomatoes in the barn, but $7\frac{3}{5}$ crates of tomatoes were rotten and had to be thrown out. Joe sold $11\frac{1}{3}$ crates of tomatoes. How many crates of tomatoes remained? Express your answer as a mixed number.

$$24\frac{\mathbf{1}}{\mathbf{2}}-7\frac{\mathbf{3}}{\mathbf{5}}-11\frac{\mathbf{1}}{\mathbf{3}}$$
$$=\frac{\mathbf{49}}{\mathbf{2}}-\frac{\mathbf{38}}{\mathbf{5}}-\frac{\mathbf{34}}{\mathbf{3}}$$
$$=\frac{\mathbf{735}}{\mathbf{30}}-\frac{\mathbf{228}}{\mathbf{30}}-\frac{\mathbf{340}}{\mathbf{30}}$$
$$=\frac{\mathbf{167}}{\mathbf{30}}$$
$$=\mathbf{5}\frac{\mathbf{17}}{\mathbf{30}}\ \textbf{crates remaining}$$

4) Determine the area of the rectangle. Show your work.

$$\textbf{area} = 3 \times 6\frac{1}{3}$$
$$= \frac{3}{1} \times \frac{19}{3}$$
$$= \frac{57}{3}$$
$$= 19 \text{ inches}^2$$



5) Use a checkmark (✓) to identify each of the following statements as either true or false.

	TRUE	FALSE
$-3x+2x$ is equal to $-5x$.		✓
The expression $(-2x+7)-(3x-1)$ is equal to $-2x+7-3x+1$.	✓	
$11x^4y^5$ and $-4x^5y^4$ are like terms.		✓
$5x^2$ is equal to $25x$.		✓
To solve the equation $2x=8$, we need to divide both sides by 2.	✓	
$x=-3$ is the solution to $x+6=3$.	✓	

6) Fatima claims that $6x+2$ is equal to $8x$. Is Fatima's claim correct? Explain.

Fatima's claim is incorrect. $6x$ and 2 are not like terms and therefore cannot be combined.

7) Simplify each expression by collecting like terms.

a) $-9x+5x+6-3$

$$= -4x+3$$

b) $3x-10-(-2x)+3$

$$= 3x-10+2x+3$$
$$= 3x+2x-10+3$$
$$= 5x-7$$

c) $-8x^2+6x-4x+3x^2$

$$= -8x^2+3x^2+6x-4x$$
$$= -5x^2+2x$$

d) $2x^2+9x-11-4x^2+11x+17$

$$= 2x^2-4x^2+9x+11x-11+17$$
$$= -2x^2+20x+6$$

e) $x+6y-9-3x+2y-3$

$$= x-3x+6y+2y-9-3$$
$$= -2x+8y-12$$

8) Simplify each expression.

a) $(2x+1)+(x+4)$

$$= 2x+1+x+4$$
$$= 2x+x+1+4$$
$$= 3x+5$$

b) $(7x+4)-(3x-9)$

$$= 7x+4-3x+9$$
$$= 7x-3x+4+9$$
$$= 4x+13$$

c) $(x^2+5x-7)+(-3x^2-4x+9)$

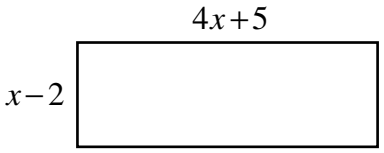
$$= x^2+5x-7-3x^2-4x+9$$
$$= x^2-3x^2+5x-4x-7+9$$
$$= -2x^2+x+2$$

d) $(9x^2+2x+6)-(-3x^2+5x-4)$

$$= 9x^2+2x+6+3x^2-5x+4$$
$$= 9x^2+3x^2+2x-5x+6+4$$
$$= 12x^2-3x+10$$

9) Determine a simplified expression that represents the perimeter of the rectangle shown below.

$$\text{perimeter} = (4x+5)+(x-2)+(4x+5)+(x-2)$$
$$= 4x+5+x-2+4x+5+x-2$$
$$= 4x+x+4x+x+5-2+5-2$$
$$= 10x+6$$



10) Solve each equation (determine the value of x). Show your work.

a) $x+6=2$

$$x+6-6=2-6$$
$$x=-4$$

b) $x-9=-15$

$$x-9+9=-15+9$$
$$x=-6$$

c) $3x=-27$

$$\frac{3x}{3}=\frac{-27}{3}$$
$$x=-9$$

d) $3x-5x=-12+4$

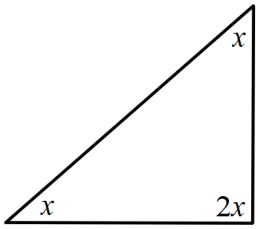
$$-2x=-8$$
$$\frac{-2x}{-2}=\frac{-8}{-2}$$
$$x=4$$

e) $18-3=-2x-x$

$$15=-3x$$
$$\frac{15}{-3}=\frac{-3x}{-3}$$
$$-5=x$$
$$x=-5$$

11) The sum of the three angles in triangle is 180º. Determine the value of x in the following triangle.

$$x+x+2x=180°$$
$$4x=180°$$
$$\frac{4x}{4}=\frac{180°}{4}$$
$$x=45°$$



12) Maya used Python to write a program for calculating the circumference of a circle based on the diameter value entered by the user. Her code is shown below.

```
1  import math
2
3  # Read value for diameter from user.
4  diameter=float(input("Enter the diameter in metres: "))
5
6  # Calculate the circumference of the circle.
7  circumference=math.pi*diameter
8
9  # Round the circumference to one decimal place.
10 rounded=round(circumference,1)
11
12 # Print the circumference of the circle.
13 print("The circumference is",rounded,"metres.")
```

a) How many variables does Maya's program use?

3 (the variables are `diameter`, `circumference`, and `rounded`)

b) What is the purpose of the word `float` in line #4?

The word `float` indicates that the user input for diameter is to be interpreted as a floating point number.

c) Explain why the code in line #1 is necessary.

The code in line #1 is necessary because the math library is needed in line #7 when the value of pi is used.

d) What will the program's output be if the user enters a diameter value of 5?

$$\begin{aligned}\text{circumference} &= \pi \times \text{diameter} \\ &= \pi \times 5 \\ &\approx 15.7\end{aligned}$$

Therefore, the program's output will be as follows:

```
The circumference is 15.7 metres.
```