

1) Make sure to include enough steps so I know you've done the problem, not your calculator.

a) Simplify  $(12-8)(15-6)$ .

$$(4)(9) \\ 36$$

b) Simplify  $24 \div 3(3+1)$ .

$$24 \div 3(4) \\ 8(4) \\ 32$$

c) Simplify  $\frac{(18-6)(2)}{18-6(2)}$ .

$$\frac{12(2)}{18-12} \\ \frac{24}{6} \quad 4$$

d) Simplify  $-[(-3)(5)(-3)]$ .

$$-[-45] \\ -45$$

e) Simplify  $\left(\frac{6}{-3}\right)\left(-\frac{6}{3}\right)\left(\frac{-6}{-3}\right)$ .

$$(-2)(-2)(2) \\ 8$$

f) Simplify  $\frac{5(-5)+(-3)(-3)}{(-5+3)(5+3)}$ .

$$\frac{-25+9}{(-2)(2)} \\ \frac{-16}{-4} \quad 4$$

g) Simplify  $7-[3-3(5-9)]$ .

$$7-[3-3(-4)] \\ 7-[3+12] \\ 7-15 \\ -8$$

h) Simplify  $7-5(2-(-8))+(-5)(3)$ .

$$7-5(10)+-15 \\ 7-50+-15 \\ -43+-15 \\ -58$$

2) a) Solve  $3(x+5) - 4x = 6(x+5) - 12x$ .

$$3x + 15 - 4x = 6x + 30 - 12x$$

$$-x + 15 = 30 - 6x$$

$$5x = 15$$

$$x = 3$$

Check your previous answer.

$$3(3+5) - 4(3)$$

$$3(8) - 12$$

$$24 - 12$$

$$12$$

$$6(3+5) - 12(3)$$

$$6(8) - 36$$

$$48 - 36 = 12 \checkmark$$

b) Solve  $x + \frac{x}{2} - \frac{1}{4} = \frac{x}{3} + \frac{11}{12}$ .

$$\frac{12}{1} \left( x + \frac{x}{2} - \frac{1}{4} \right) = \frac{12}{1} \left( \frac{x}{3} + \frac{11}{12} \right)$$

$$12x + 6x - 3 = 4x + 11$$

$$18x - 3 = 4x + 11$$

$$14x = 14$$

$$x = 1$$

Check your previous answer.

$$1 + \frac{1}{2} - \frac{1}{4}$$

$$\frac{4}{4} + \frac{2}{4} - \frac{1}{4} = \frac{5}{4}$$

$$\frac{1}{3} + \frac{11}{12}$$

$$\frac{4}{12} + \frac{11}{12}$$

$$\frac{15}{12} = \frac{3.5}{3.4} = \frac{5}{4} \checkmark$$

3 Given that  $D(t) = 6t + 11$  find;

a)  $D(-7)$

$$6(-7) + 11$$

$$-42 + 11$$

$$-31$$

b)  $t$  if  $D(t) = -7$

$$-7 = 6t + 11$$

$$-18 = 6t$$

$$-3 = t$$

check

$$6(-3) + 11$$

$$-7 \checkmark$$

4) Omemee was a town in North Dakota at the Junction of the Great Northern Railway and the Soo Line Railway. Some information about the population of Omemee is to the right.

Years after 1910	Population of Omemee North Dakota
10	210
20	150
30	90

a) Explain in English what the point (20,150) is telling you. Be specific.

In 1930 the population was 150.

b) Use the slope formula to show the value of the slope is  $-6$  and discuss the meaning of the slope.

$$\frac{210 - 150}{10 - 20} = \frac{60}{-10} = -6$$

Six less people are living in Omemee every year.

c) Show algebraically that the value of  $b$  is 270 and discuss the meaning of  $b$ .

$$210 = -6(10) + b$$

$$210 = -60 + b$$

$$270 = b$$

In 1910 the population of Omemee was 270.

d) Using  $P$  for the population and  $t$  for the number of years after 1910, build the linear function using functional notation.

$$P(t) = -6t + 270$$

e) Using the function answer the question  $P(35)$  is asking.

$$P(35) = -6(35) + 270$$

$$= 60$$

In 1945 the population was 60.

f) Using the function answer the question  $P(t) = 0$  is asking.

$$0 = -6t + 270$$

$$-270 = -6t$$

$$45 = t$$

In 1955 no one was living in Omemee.