

Question #2

a)
$$\begin{aligned} & \underline{t^5 + 7t^2 - 2} + \underline{6t^4 - 7t^2 + 9t^3 + 18} - \underline{4t - 8t^5} \\ & -7t^5 + 0t^2 - 2 + 6t^4 + 9t^3 - 4t \\ & \boxed{-7t^5 + 6t^4 + 9t^3 - 4t - 2} \end{aligned}$$

b)
$$\begin{aligned} & \underline{-3y^2 + 15y - 13} - \underline{6y^2 + 9y^4 - 8y^3 - 12y^4 + 13 + 3y - 10y^4} \\ & -9y^2 + 18y + 0 - 13y^4 - 8y^3 \\ & \boxed{-13y^4 - 8y^3 - 9y^2 + 18y} \end{aligned}$$

Question #3

a)
$$(-2b^6 + 3b^4 - b^2) + (b^6 + 2b^4 + 2b^2)$$

$$\boxed{-b^6 + 5b^4 + b^2}$$

b)
$$(x^5 + 9x^4 - 18x^3 - 5x^2 + 6x - 9) + (-2x^5 - 3x^4 + 4x^3 - x^2 - 6x + 8)$$

$$\boxed{-x^5 + 6x^4 - 14x^3 - 6x^2 - 1}$$

c)
$$(5x^2y - 2xy + 9xy^2) - (8x^2y + 13xy + 12xy^2)$$

$$(5x^2y - 2xy + 9xy^2) + (-8x^2y - 13xy - 12xy^2)$$

$$\boxed{-3x^2y - 15xy - 3xy^2}$$

d)
$$(-5x^4 + 6x^3 - 9x^2 + 12x + 13) - (3x^4 + 6x^3 + 2x^2 - 8x + 2)$$

$$(-5x^4 + 6x^3 - 9x^2 + 12x + 13) + (-3x^4 - 6x^3 - 2x^2 + 8x - 2)$$

$$\boxed{-8x^4 - 11x^2 + 20x + 11}$$

Question #4

a)
$$\begin{aligned} & 5xy(9x^2y^3)(2x^4) \\ & 45x^3y^4(2x^4) \\ & \boxed{90x^7y^4} \end{aligned}$$

b)
$$\begin{aligned} & 9ab^2(4a^3 - 3ab - 5b^2) \\ & \boxed{36a^4b^2 - 27a^2b^3 - 45ab^4} \end{aligned}$$

c)
$$\begin{aligned} & (6a^4b^2)^3 \\ & (6a^4b^2)(6a^4b^2)(6a^4b^2) \\ & 3(6a^8b^4)(6a^4b^2) \\ & \boxed{12(6a^{12}b^6)} \end{aligned}$$

d)
$$\begin{aligned} & (t-6)(t+7) \\ & t^2 + 7t - 6t - 42 \\ & \boxed{t^2 + t - 42} \end{aligned}$$

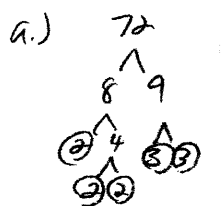
e)
$$\begin{aligned} & (x-4y)(3x-8y) \\ & 3x^2 - 8xy - 12xy + 32y^2 \\ & \boxed{3x^2 - 20xy + 32y^2} \end{aligned}$$

f)
$$\begin{aligned} & (5z+3)(7z-9) \\ & 35z^2 - 45z + 21z - 27 \\ & \boxed{35z^2 - 24z - 27} \end{aligned}$$

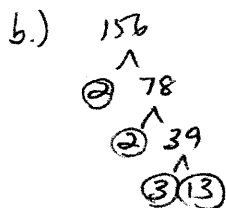
g)
$$\begin{aligned} & (2x-1)(x^2-4x+2) \\ & 2x^3 - 8x^2 + 4x - x^2 + 4x - 2 \\ & \boxed{2x^3 - 9x^2 + 8x - 2} \end{aligned}$$

Question #1 on page 8.

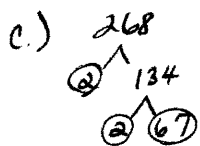
Question #5



$72 = 2^3 \cdot 3^2$

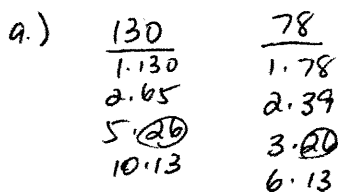


$156 = 2^2 \cdot 3 \cdot 13$

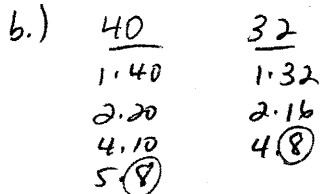


$268 = 2^2 \cdot 67$

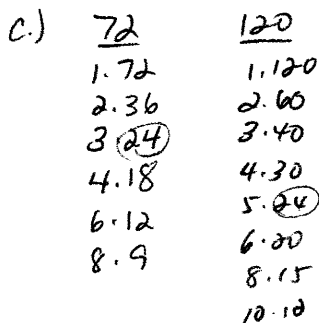
Question #7



$GCF = 26$

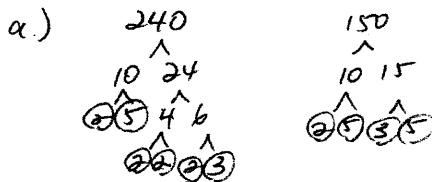


$GCF = 8$



$GCF = 24$

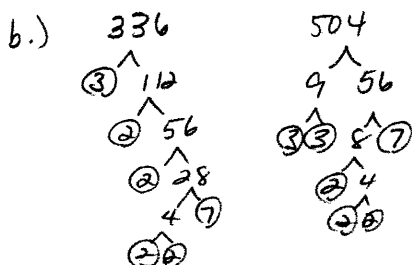
Question #8



$240 = 2^4 \cdot 3 \cdot 5$

$150 = 2 \cdot 3 \cdot 5^2$

$GCF = 2 \cdot 3 \cdot 5 = 30$

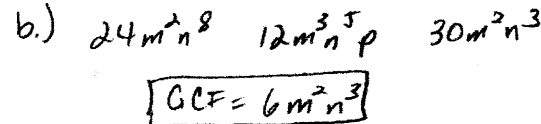
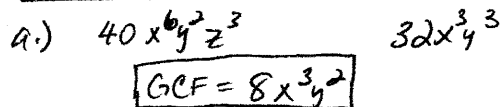


$336 = 2^4 \cdot 3 \cdot 7$

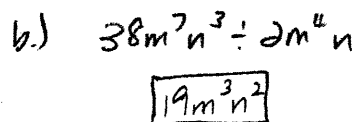
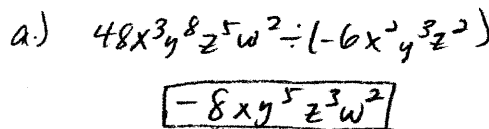
$504 = 2^3 \cdot 3^2 \cdot 7$

$GCF = 2^3 \cdot 3 \cdot 7 = 168$

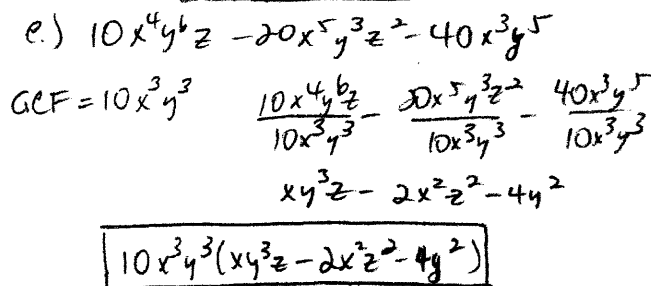
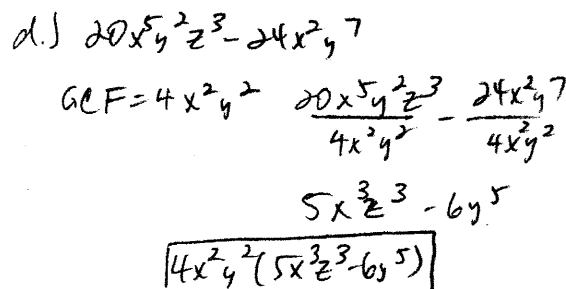
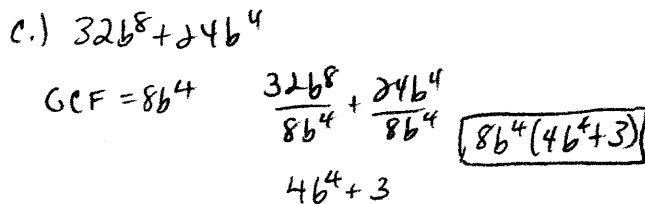
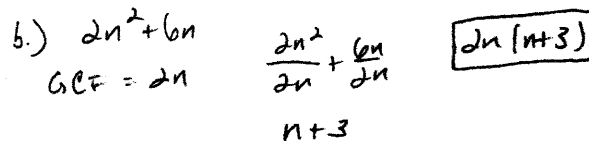
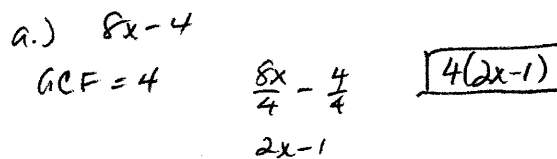
Question #9



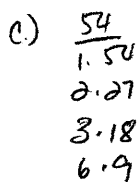
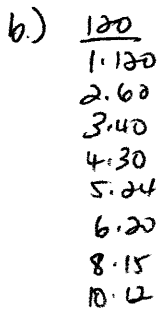
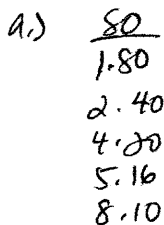
Question #10



Question #11



Question #6



Question #12

a.) Net = Revenue - Cost

$$\text{Net} = (9lw + 45) - (3lw + t)$$

$$(9lw + 45) + (-3lw - t)$$

$$\boxed{\text{Net} = 6lw + 45 - t}$$

b.) $w = 12 \text{ ft}$, $l = 14 \text{ ft}$, $t = 672 \text{ tiles}$

$$\text{Net} = 6(14)(12) + 45 - 672$$

$$84(12) + 45 - 672$$

$$1008 + 45 - 672$$

$$1053 - 672$$

$$\text{Net} = \$381$$

The net is \$381

Question #13

small = s medium = m large = l

a.) Revenue = $5s + 9m + 15l$

b.) Cost = $2s + 4m + 7l$

c.) Net = Revenue - Cost

$$= (5s + 9m + 15l) - (2s + 4m + 7l)$$

$$= (5s + 9m + 15l) + (-2s - 4m - 7l)$$

$$= \boxed{3s + 5m + 8l}$$

d.) Net = $3(6) + 5(9) + 8(3)$

$$= 18 + 45 + 24$$

$$= 87$$

The net is \$87

Question #14

a.) $y + 19 = -6$

$$y + 19 - 19 = -6 - 19$$

$$\boxed{y = -25}$$

check:

$$-25 + 19 \stackrel{?}{=} -6$$

$$-6 = -6 \checkmark$$

b.) $5 = t - 11$

$$5 + 11 = t - 11 + 11$$

$$\boxed{16 = t}$$

check:

$$5 \stackrel{?}{=} 16 - 11$$

$$5 = 5 \checkmark$$

c.) $2x - 15 - x = 9 - 17$

$$x - 15 = -8$$

$$x - 15 + 15 = -8 + 15$$

$$\boxed{x = 7}$$

check:

$$2(7) - 15 - 7 \stackrel{?}{=} 9 - 17$$

$$14 - 15 - 7 \stackrel{?}{=} -8$$

$$-1 - 7 \stackrel{?}{=} -8$$

$$-8 = -8 \checkmark$$

d.) $6b + 7 = 5b + 3$

$$6b + 7 - 5b = 5b + 3 - 5b$$

$$b + 7 = 3$$

$$b + 7 - 7 = 3 - 7$$

$$\boxed{b = -4}$$

check:

$$6(-4) + 7 \stackrel{?}{=} 5(-4) + 3$$

$$-24 + 7 \stackrel{?}{=} -20 + 3$$

$$-17 = -17 \checkmark$$

e.) $8u + 13 - 2u = 2u + 11 + 3u$

$$6u + 13 = 5u + 11$$

$$6u + 13 - 5u = 5u + 11 - 5u$$

$$u + 13 = 11$$

$$u + 13 - 13 = 11 - 13$$

$$\boxed{u = -2}$$

check:

$$8(-2) + 13 - 2(-2) \stackrel{?}{=} 2(-2) + 11 + 3(-2)$$

$$-16 + 13 + 4 \stackrel{?}{=} -4 + 11 - 6$$

$$-3 + 4 \stackrel{?}{=} 7 - 6$$

$$1 = 1 \checkmark$$

f.) $9 - 5(b - 1) = -4(b - 2)$

$$9 - 5b + 5 = -4b + 8$$

$$14 - 5b = -4b + 8$$

$$14 - 5b + 5b = -4b + 8 + 5b$$

$$14 = b + 8$$

$$14 - 8 = b + 8 - 8$$

$$\boxed{6 = b}$$

check:

$$9 - 5(b - 1) \stackrel{?}{=} -4(b - 2)$$

$$9 - 5 \cdot 5 \stackrel{?}{=} -4(4)$$

$$9 - 25 \stackrel{?}{=} -16$$

$$-16 = -16 \checkmark$$

g.) $5t = 20$

$$\frac{5t}{5} = \frac{20}{5}$$

$$\boxed{t = 4}$$

check:

$$5(4) \stackrel{?}{=} 20$$

$$20 = 20$$

h.) $-15n = 45$

$$\frac{-15n}{-15} = \frac{45}{-15}$$

$$\boxed{n = -3}$$

check:

$$-15(-3) \stackrel{?}{=} 45$$

$$45 = 45 \checkmark$$

i.) $9u - 17 = -53$

$$9u - 17 + 17 = -53 + 17$$

$$9u = -36$$

$$\frac{9u}{9} = \frac{-36}{9}$$

$$\boxed{u = -4}$$

check:

$$9(-4) - 17 \stackrel{?}{=} -53$$

$$-36 - 17 \stackrel{?}{=} -53$$

$$-53 = -53 \checkmark$$

Question #14 continued

$$\begin{aligned}
 j.) \quad & -4y + 15 = -9y - 20 \\
 & -4y + 15 + 9y = -9y - 20 + 9y \\
 & 5y + 15 = -20 \\
 & 5y + 15 - 15 = -20 - 15 \\
 & 5y = -35 \\
 & \frac{5y}{5} = \frac{-35}{5} \\
 & \boxed{y = -7}
 \end{aligned}$$

check:

$$\begin{aligned}
 -4(-7) + 15 & \stackrel{?}{=} -9(-7) - 20 \\
 28 + 15 & \stackrel{?}{=} 63 - 20 \\
 43 & = 43 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 k.) \quad & 5 - 8x - 24 = 7x + 11 - 5x \\
 & -8x - 19 = 2x + 11 \\
 & -8x - 19 + 8x = 2x + 11 + 8x \\
 & -19 = 10x + 11 \\
 & -19 - 11 = 10x + 11 - 11 \\
 & \frac{-30}{10} = \frac{10x}{10} \\
 & \boxed{-3 = x}
 \end{aligned}$$

check:

$$\begin{aligned}
 5 - 8(-3) - 24 & \stackrel{?}{=} 7(-3) + 11 - 5(-3) \\
 5 + 24 - 24 & \stackrel{?}{=} -21 + 11 + 15 \\
 29 - 24 & \stackrel{?}{=} -10 + 15 \\
 5 & = 5 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 l.) \quad & 13 - 9h - 15 = 7h + 22 - 8h \\
 & -9h - 2 = 22 - h \\
 & -9h - 2 + 9h = 22 - h + 9h \\
 & -2 = 8h + 22 \\
 & -2 - 22 = 8h + 22 - 22 \\
 & \frac{-24}{8} = \frac{8h}{8} \\
 & \boxed{-3 = h}
 \end{aligned}$$

check:

$$\begin{aligned}
 13 - 9(-3) - 15 & \stackrel{?}{=} 7(-3) + 22 - 8(-3) \\
 13 + 27 - 15 & \stackrel{?}{=} -21 + 22 + 24 \\
 40 - 15 & \stackrel{?}{=} 1 + 24 \\
 25 & = 25 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 m.) \quad & -2(x+7) - 9 = 5x + 12 \\
 & -2x - 14 - 9 = 5x + 12 \\
 & -2x - 23 = 5x + 12 \\
 & -2x - 23 + 2x = 5x + 12 + 2x \\
 & -23 = 7x + 12 \\
 & -23 - 12 = 7x \\
 & \frac{-35}{7} = \frac{7x}{7} \\
 & \boxed{-5 = x}
 \end{aligned}$$

check:

$$\begin{aligned}
 -2(-5+7) - 9 & \stackrel{?}{=} 5(-5) + 12 \\
 -2(2) - 9 & \stackrel{?}{=} -25 + 12 \\
 -4 - 9 & \stackrel{?}{=} -25 + 12 \\
 -13 & = -13 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 n.) \quad & 11x - 4(2x-3) = 18 + 5(x+2) \\
 & 11x - 8x + 12 = 18 + 5x + 10 \\
 & 3x + 12 = 5x + 28 \\
 & 3x + 12 - 3x = 5x + 28 - 3x \\
 & 12 = 2x + 28 \\
 & 12 - 28 = 2x + 28 - 28 \\
 & \frac{-16}{2} = \frac{2x}{2} \\
 & \boxed{-8 = x}
 \end{aligned}$$

check:

$$\begin{aligned}
 11(-8) - 4(2(-8) - 3) & \stackrel{?}{=} 18 + 5(-8 + 2) \\
 11(-8) - 4(-16 - 3) & \stackrel{?}{=} 18 + 5(-6) \\
 11(-8) - 4(-19) & \stackrel{?}{=} 18 + (-30) \\
 -88 + 76 & \stackrel{?}{=} -12 \\
 -12 & = -12 \checkmark
 \end{aligned}$$

$$\begin{aligned}
 o.) \quad & 6x - (3x+7) = 14 - 4(x-6) \\
 & 6x - 3x - 7 = 14 - 4x + 24 \\
 & 5x - 7 = 38 - 4x \\
 & 5x - 7 + 4x = 38 - 4x + 4x \\
 & 9x - 7 = 38 \\
 & 9x - 7 + 7 = 38 + 7 \\
 & \frac{9x}{9} = \frac{45}{9} \\
 & \boxed{x = 5}
 \end{aligned}$$

check:

$$\begin{aligned}
 6(5) - (3(5) + 7) & \stackrel{?}{=} 14 - 4(5 - 6) \\
 6(5) - (15 + 7) & \stackrel{?}{=} 14 - 4(-1) \\
 6(5) - 22 & \stackrel{?}{=} 14 + 4 \\
 40 - 22 & \stackrel{?}{=} 18 \\
 18 & = 18 \checkmark
 \end{aligned}$$

Question #15 +

a.) Five more than a number is equal to negative seven.

$$5 + n = -7$$

$$5 + n - 5 = -7 - 5$$

$$n = -12$$

b.) The difference of a number and nine is equal to four.

$$n - 9 = 4$$

$$n - 9 + 9 = 4 + 9$$

$$n = 13$$

c.) Six ^{-Reverse} less than a number is fifteen

$$n - 6 = 15$$

$$n - 6 + 6 = 15 + 6$$

$$n = 21$$

d.) A number decreased by twenty-four is negative seven.

$$n - 24 = -7$$

$$n - 24 + 24 = -7 + 24$$

$$n = 17$$

e.) Eighteen ^{-Reverse} subtracted from negative seven times y is equal to three

$$-7y - 18 = 3$$

$$-7y - 18 + 18 = 3 + 18$$

$$\frac{-7y}{-7} = \frac{21}{-7}$$

$$y = -3$$

f.) Thirty-nine minus five times x is equal to the product of eight and x.

$$39 - 5x = 8x$$

$$39 - 5x + 5x = 8x + 5x$$

$$\frac{39}{13} = \frac{13x}{13}$$

$$3 = x$$

g.) Forty ^{-Reverse} less than the product of three and y is equal to seven times y.

$$3y - 40 = 7y$$

$$3y - 40 - 3y = 7y - 3y$$

$$\frac{-40}{4} = \frac{4y}{4}$$

$$-10 = y$$

Question #15 Continued

k. Six times x plus five times the difference of x and seven is equal to nineteen minus the sum of x and six.

$$6x + 5(x - 7) = 19 - (x + 6)$$

$$6x + 5x - 35 = 19 - x - 6$$

$$11x - 35 = 13 - x$$

$$11x - 35 + x = 13 - x + x$$

$$12x - 35 = 13$$

$$12x - 35 + 35 = 13 + 35$$

$$\frac{12x}{12} = \frac{48}{12}$$

$$x = 4$$

l. Two times r subtracted from seven times the sum of r and one is equal to three times the difference of r and five.

$$7(r + 1) - 2r = 3(r - 5)$$

$$7r + 7 - 2r = 3r - 15$$

$$5r + 7 = 3r - 15$$

$$5r + 7 - 3r = 3r - 15 - 3r$$

$$2r + 7 = -15$$

$$2r + 7 - 7 = -15 - 7$$

$$\frac{2r}{2} = \frac{-22}{2}$$

$$r = -11$$

j. The sum of n and three subtracted from twelve times n is the same as negative eleven plus the product of 2 and the difference of n and five.

$$12n - (n + 3) = -11 + 2(n - 5)$$

$$12n - n - 3 = -11 + 2n - 10$$

$$11n - 3 = 2n - 21$$

$$11n - 3 - 2n = -21$$

$$9n - 3 = -21$$

$$9n - 3 + 3 = -21 + 3$$

$$\frac{9n}{9} = \frac{-18}{9}$$

$$n = -2$$

Question #16

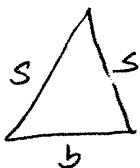
$$\begin{aligned}
 P &= 300 \text{ ft} \\
 l &= 4w \\
 P &= 2l + 2w \\
 300 &= 2(4w) + 2w \\
 300 &= 2(4w) + 2w \\
 300 &= 8w + 2w \\
 300 &= 10w \\
 \frac{300}{10} &= \frac{10w}{10} \\
 30 &= w
 \end{aligned}$$

$$\begin{aligned}
 l &= 4w \\
 l &= 4(30) = 120
 \end{aligned}$$

The length is 120 ft and the width is 30 ft.

Question #17

s = side
b = base



$$\begin{aligned}
 s &= 2b - 5 \\
 \text{Perimeter} &= 70
 \end{aligned}$$

$$\begin{aligned}
 s + s + b &= 70 \\
 (2b - 5) + (2b - 5) + b &= 70 \\
 5b - 10 &= 70 \\
 5b - 10 + 10 &= 70 + 10 \\
 5b &= 80 \\
 \frac{5b}{5} &= \frac{80}{5} \\
 b &= 16
 \end{aligned}$$

$$\begin{aligned}
 s &= 2(16) - 5 \\
 &= 32 - 5 \\
 &= 27
 \end{aligned}$$

The base is 16m and the sides are 27m.

Question #18

l = length
w = width

$$\begin{aligned}
 \text{Perimeter} &= 84 \text{ ft} \\
 P &= 2l + 2w \\
 84 &= 2l + 2w \\
 84 &= 2l + 2(l - 4) \\
 84 &= 2l + 2l - 8 \\
 84 &= 4l - 8 \\
 84 + 8 &= 4l - 8 + 8 \\
 92 &= 4l \\
 \frac{92}{4} &= \frac{4l}{4} \\
 23 &= l \\
 w &= l - 4 \\
 w &= 23 - 4 = 19
 \end{aligned}$$

The length is 23 ft and the width is 19 ft.

Question #19

first angle = f
second angle = s
third angle = t

$$f + s + t = 180 \quad s = 10 + f \quad t = f - 7$$

$$\begin{aligned}
 f + (10 + f) + (f - 7) &= 180 \\
 3f + 3 &= 180 \\
 3f + 3 - 3 &= 180 - 3 \\
 3f &= 177 \\
 \frac{3f}{3} &= \frac{177}{3} \\
 f &= 59
 \end{aligned}$$

$$\begin{aligned}
 s &= 10 + f \\
 &= 10 + 59 = 69
 \end{aligned}$$

$$\begin{aligned}
 t &= f - 7 \\
 &= 59 - 7 = 52
 \end{aligned}$$

The angles are 59°, 69°, 52°

Question #20

length = l
width = w

$$\begin{aligned}
 l &= 3w - 2 \\
 P &= 188 \\
 P &= 2l + 2w \\
 188 &= 2(3w - 2) + 2w
 \end{aligned}$$

$$\begin{aligned}
 188 &= 2(3w - 2) + 2w \\
 188 &= 6w - 4 + 2w \\
 188 &= 8w - 4 \\
 188 + 4 &= 8w - 4 + 4 \\
 \frac{192}{8} &= \frac{8w}{8} \\
 24 &= w
 \end{aligned}$$

$$\begin{aligned}
 l &= 3w - 2 \\
 l &= 3(24) - 2 \\
 &= 72 - 2 = 70
 \end{aligned}$$

The length is 70 m and the width is 24 m

Question #21

Not on exam #2.

Question #22

a.) $\frac{52}{9}$

$\boxed{5\frac{7}{9}}$

b.) $-\frac{111}{20}$

$\boxed{-5\frac{11}{20}}$

$\begin{array}{r} 5 \\ 9 \overline{) 52} \\ \underline{-45} \\ 7 \end{array}$

$\begin{array}{r} 5 \\ 20 \overline{) 111} \\ \underline{-100} \\ 11 \end{array}$

Question #23

a.) $13\frac{2}{5}$

$\boxed{\frac{67}{5}}$

b.) $-15\frac{5}{6}$

$\boxed{-\frac{95}{6}}$

$\begin{array}{r} 13 \\ \times 5 \\ \hline 65 \end{array} \quad \begin{array}{r} 65 \\ + 2 \\ \hline 67 \end{array}$

$\begin{array}{r} 15 \\ \times 6 \\ \hline 90 \end{array} \quad \begin{array}{r} 90 \\ + 5 \\ \hline 95 \end{array}$

Question #24

a.) $\frac{66 \div 22}{88 \div 22} = \boxed{\frac{3}{4}}$

b.) $\frac{-196 \div 2}{20 \div 2} = \frac{-98 \div 7}{105 \div 7} = \boxed{\frac{-14}{15}}$

c.) $\frac{10x^{\div 2}}{32 \div 2} = \boxed{\frac{5x}{16}}$

d.) $\frac{30h^{\div 6}k}{18h^{\div 6}k} = \frac{5h^6k}{3h^6k} = \frac{5k}{3k^2} = \boxed{\frac{5}{3k^2}}$

e.) $\frac{-38a^{\div 19}4b^5c^2d^{\div 4}}{95a^{10}b^{\div 5}c^7} = \frac{-2a^4b^5c^2d^4}{5a^{10}b^5c^7} = \frac{-2b^4c^2d^4}{5a^6b^5c^7} = \frac{-2b^4c^2d^4}{5a^6b^5c^5} = \boxed{\frac{-2b^4d^4}{5a^6c^5}}$

Question #1

a.) Five more than a number
 $\boxed{5+n}$

b.) The difference of a number and nine
 $\boxed{n-9}$

c.) Six less than a number
 $\boxed{n-6}$

d.) A number decreased by twenty-four
 $\boxed{n-24}$

e.) Eighteen subtracted from negative seven times y
 $\boxed{-7y-18}$

f.) Thirty-nine minus five times x
 $\boxed{39-5x}$

g.) The product of eight and x
 $\boxed{8x}$

and g.) Forty less than the product of three and y
 $\boxed{3y-40}$

h.) Six times x plus five times the difference of x and seven
 $\boxed{6x+5(x-7)}$

i.) Nineteen minus the sum of x and six
 $\boxed{19-(x+6)}$

j.) Twice r subtracted from seven times the sum of r and one
 $\boxed{7(r+1)-2r}$

k.) Three times the difference of r and five
 $\boxed{3(r-5)}$

l.) The sum of n and three subtracted from twelve times n
 $\boxed{12n-(n+3)}$

m.) Negative eleven plus the product of 2 and the difference of n and five
 $\boxed{-11+2(n-5)}$