

MATH 9A – FINAL EXAM REVIEW

1. Simplify using order of operations.

a) $8 + 10 \div 2$

b) $(12 - 3) \cdot (24 \div 8)$

c) $30 \div 5 + 2 \cdot 12$

d) $\frac{(5+3) \times 2}{6 \times 3 - 5 \times 2}$

2. Evaluate each expression.

a) $2x - 3y$

$x = 5$ and $y = 2$

b) $19 - 2y$

$y = 5$

c) $3(x + 2y)$

$x = 9$ and $y = 4$

d) $y - 10x$

$x = 2$ and $y = 30$

3. Arrange from smallest to largest.

1.7, 1.6, 1.05, 0.7, 1.57, 1.75, 1.007

4. Replace the blank with a ">", "<" or "=" to make the statement true.

a) 7.89 ____ 7.98

b) 0.008 ____ 0.01

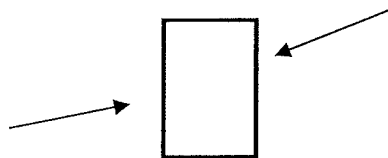
c) 5.92 ____ 0.592

d) $\$0.5$ ____ 50 ¢

e) -31 ____ 0

f) -8 ____ -9

5. Name each part of the power term:



6. Evaluate each power.

a) 2^3

b) 1^5

c) 5^2

d) 6^3

e) 10^4

f) $2^4 - 3^3$

g) $9^2 + 5^3$

h) $2(4)^2$

7. simplify using the exponent laws.

a) $x^7 \cdot x^3$

b) $x^{12}(x^3)$

c) $\frac{x^8}{x^2}$

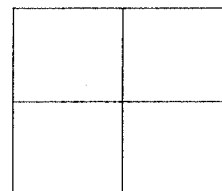
d) $\frac{12x^6}{6x^5}$

e) $(x^3)^4$

8. Write the fraction indicated using the data provided. In a class of 30 students, 18 have blue eyes and 12 have brown eyes.

What fraction of the class has brown eyes? _____

What PERCENT of the class has blue eyes? _____



9. Simplify each fraction.

a) $\frac{48}{100}$

b) $\frac{12}{42}$

c) $\frac{24}{28}$

d) $\frac{40}{25}$

10. Solve each proportion.

a) $\frac{10}{15} = \frac{n}{3}$

b) $\frac{5}{8} = \frac{25}{x}$

c) $\frac{9}{2} = \frac{x}{7}$

d) $\frac{x}{8} = \frac{7}{10}$

PART 2

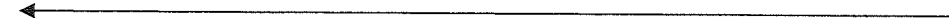
1. Ron made 9 out of 15 free throws and Jeff made 8 out of 12. Who made the greatest fraction of free throws? What was his shooting percentage?

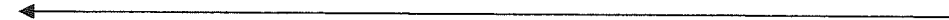
2. On a numberline, show where each of the fractions is located.

a) $\frac{1}{2}$ 

b) $\frac{4}{5}$ 

c) $\frac{7}{3}$ 

d) $\frac{10}{4}$ 

e) $\frac{3}{7}$ 

3. Perform the operation indicated.

a) $\frac{1}{5} + \frac{2}{5} =$

b) $\frac{1}{3} + \frac{1}{4} =$

c) $1\frac{1}{2} + 2\frac{7}{10} =$

d) $\frac{3}{4} + \frac{5}{10} - \frac{1}{2} =$

e) $\frac{2}{3} \times \frac{1}{5} =$

f) $\frac{4}{9} \times 1\frac{3}{4} =$

g) $\frac{2}{5} \div \frac{1}{3} =$

h) $3\frac{1}{2} \div \frac{3}{8} =$

$$i) \frac{1}{4} \left(\frac{7}{10} - \frac{3}{10} \right) =$$

$$j) \frac{1}{5} + \frac{1}{2} \times \frac{3}{5} =$$

4. Place the integers on the numberline.

-6, 2, 4, -2, 0, 10, -7



5. Compare the numbers using $>$ or $<$

$$6 \square 12$$

$$9 \square 0$$

$$-3 \square 1$$

$$-4 \square -2$$

6. Arrange from smallest to largest.

9, -12, 3, -5, 0, -9, 8, 24, -25

7. Perform the indicated operation.

$$a) 8 + (-6)$$

$$b) -11 + (-5)$$

$$c) -14 + 9$$

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

$$e) -8 - 9$$

$$f) 10 - 14$$

$$g) -6 - (-4)$$

$$h) -12 - 8 - (-3)$$

Part 3

1. Calculate:

a) $-6 + 10$

b) $5 - (-3)$

c) $(-2)(-3)$

d) $-1 \times 5 + 10$

e) $-20(-6 - 4)$

f) $[4 + 2 - 8 - 12 + 9] \cdot -2$

g) $[-5 - 3 + 4 - 2] \cdot 0$

2. The temperature at 8 am was -4°C , at 2 pm the temperature was 5°C . What was the difference?

3. Evaluate each expression.

a) $4c + a$

if $a = (-3)$
 $c = (-5)$

b) x^2

if $x = -6$

c) $2x - x^2$

if $x = -3$

d) $\frac{7-2a}{3}$

if $a = -5$

3. Model the following expressions using algebra tiles.

a) $-2 + 5$

b) $-x + 2 - 4 + 3x$

c) $x^2 - 4x + 3 + 2x - 1$

4. Simplify by collecting the like terms.

a) $10n + 5n$

b) $2n + 7m - 4n - 9m$

c) $7y^2 - 12y - y + y^2 - 9y$

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

e) $4(3x - 2)$

f) $5(2x + 4) - 3(x - 9)$

5. Fill in a number that makes a true statement.

a) $\square + 3 = 10$

b) $6 - \square = 4$

c) $3(\square) = 12$

6. Solve each equation below. Show all of your work!

a) $x - 9 = 12$

b) $x + 14 = 27$

c) $x + 3 = -10$

d) $x - 4 = -8$

e) $5x = 15$

f) $-2x = 22$

g) $3x = 18$

h) $-2x = 12$

i) $2x - 4 = 12$

j) $7x + 2 = 30$

k) $5x - 8 = -23$

l) $-3x - 2 = 43$

m) $4(x + 3) = 20$

n) $10 = 2(x - 7)$

o) $5x + 2 = 4x - 10$

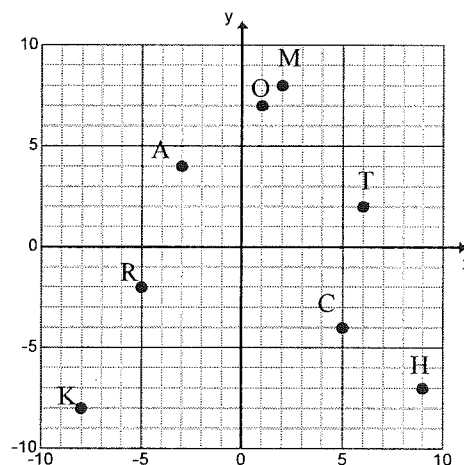
Part 4

1. Extend the linear pattern

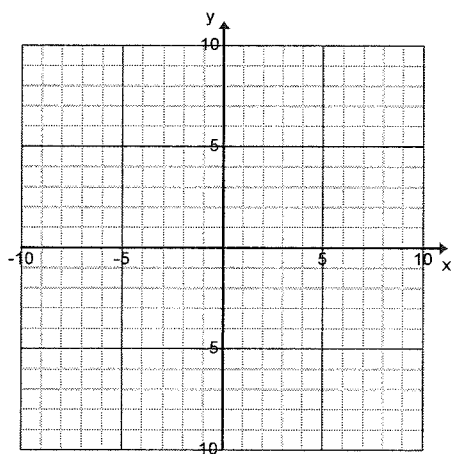
- a) 6, 9, 12, _____, _____, _____, _____
- b) 22, 17, 12, _____, _____, _____, _____
- c) -16, -10, -4, _____, _____, _____, _____
- d) 15, 7, -1, _____, _____, _____, _____

2. What are the coordinates?

M
A
T
H
R
O
C
K



3. Plot the following points on the grid.



A (3, 9)

B (-4, 2)

C (0.5)

D (-3, -6)

4. Fill in the table of values for each equation

$$Y = x + 1$$

x	y
0	
1	
2	
3	

$$y = 2x - 6$$

x	y
4	
3	
2	
1	

$$y = -3x$$

x	y
2	
-2	
1	
-3	

5. Given the scale factor, determine if it is an enlargement or a reduction.

SF = 9 enlargement or reduction

SF = 0.2 enlargement or reduction

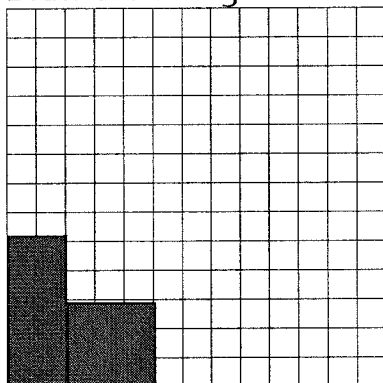
SF = $\frac{3}{4}$ enlargement or reduction

SF = 6 enlargement or reduction

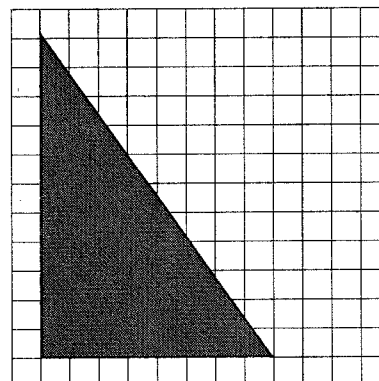
6. Fill in the scale factor chart

Original length	Scale factor	Image length
12 cm	2	
8 m	3	
4.5 mm	0.5	
	4	28 m
	2	17 cm
	0.5	3 mm

7. Draw the enlargement or reduction



Scale factor of 2

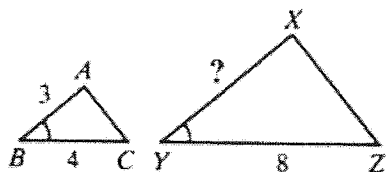


Scale factor of $\frac{1}{2}$

Part 5

1. Determine the missing side lengths in the similar shapes.

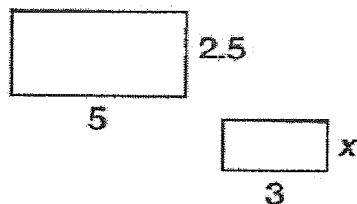
a)



$$\frac{\text{small } \Delta}{\text{big } \Delta} = \frac{4}{8} = \frac{3}{?}$$

The missing side is _____.

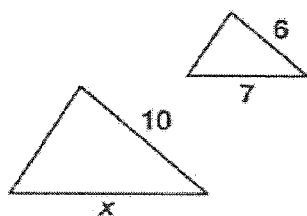
b)



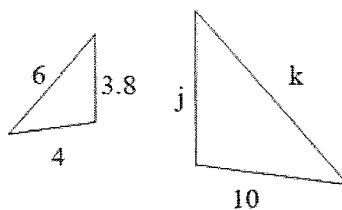
$$\frac{\text{small } \square}{\text{big } \square} = \frac{3}{5} = \frac{x}{2.5}$$

X = _____

c).

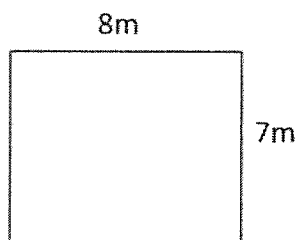


d)

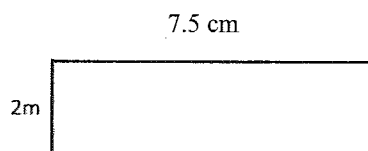


5. j = _____ k = _____

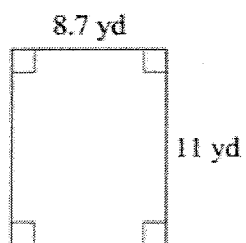
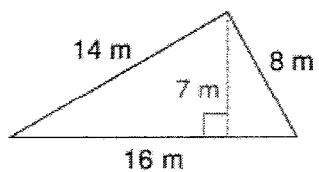
2. Determine the perimeter for each shape



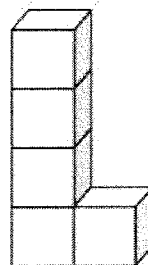
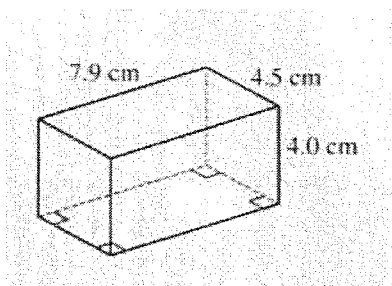
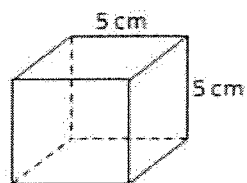
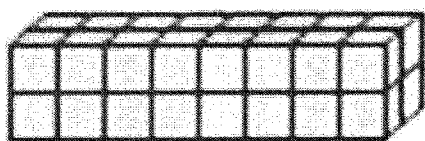
Perimeter = _____ m



3. Determine the area for each shape



4. Calculate the surface area



MATH 9A – FINAL EXAM REVIEW

Key

1. Simplify using order of operations.

a) $8 + 10 \div 2$

(13)

b) $(12 - 3) \cdot (24 \div 8)$

$9 \cdot 3$

(27)

c) $30 \div 5 + 2 \cdot 12$

$6 + 24$

(30)

d) $\frac{(5+3) \times 2}{6 \times 3 - 5 \times 2}$

$\frac{16}{18 - 10}$

$\frac{16}{8}$

(2)

2. Evaluate each expression.

a) $2x - 3y$

$x = 5$ and $y = 2$

$10 - 6$

(4)

b) $19 - 2y$

$y = 5$

$19 - 10$

(9)

c) $3(x + 2y)$

$x = 9$ and $y = 4$

$3(9 + 8)$

(51)

d) $y - 10x$ $x = 2$ and $y = 30$

$30 - 20$

(10)

3. Arrange from smallest to largest.

1.7, 1.6, 1.05, 0.7, 1.57, 1.75, 1.007

0.7 1.007 1.05 1.57 1.6 1.7 1.75

4. Replace the blank with a ">", "<" or "=" to make the statement true.

a) $7.89 < 7.98$

b) $0.008 < 0.01$

c) $5.92 > 0.592$

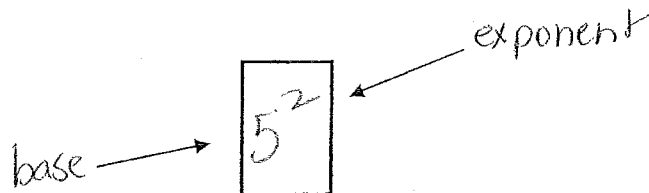
d) $\$0.5 = 50 \text{ ¢}$

units

e) $-31 < 0$

f) $-8 > -9$

5. Name each part of the power term:



6. Evaluate each power.

a) 2^3 $2 \cdot 2 \cdot 2 = (8)$ b) 1^5 $1 \cdot 1 \cdot 1 \cdot 1 \cdot 1 = (1)$ c) 5^2 $5 \cdot 5 = (25)$ d) 6^3 $6 \cdot 6 \cdot 6 = (216)$ e) 10^4 $10 \cdot 10 \cdot 10 \cdot 10 = (10000)$

f) $2^4 - 3^3$ $2222 - 333$ $16 - 27 = (-11)$ g) $9^2 + 5^3$ $81 + 125 = 206$ h) $2(4)^2$ $2 \cdot 4 \cdot 4 = (16)$

7. simplify using the exponent laws.

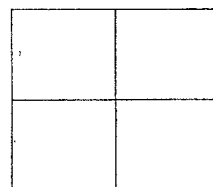
a) $x^7 \cdot x^3 = x^{10}$ b) $x^{12}(x^3) = x^{15}$ c) $\frac{x^8}{x^2} = x^6$ d) $\frac{12x^6}{6x^5} = 2x$ e) $(x^3)^4 = x^{12}$

8. Write the fraction indicated using the data provided. In a class of 30 students, 18 have blue eyes and 12 have brown eyes.

What fraction of the class has brown eyes? $\frac{12}{30}$

What PERCENT of the class has blue eyes? $\frac{18}{30} = 0.6 \rightarrow 60\%$

~~$\frac{18}{30} = \frac{2}{100}$~~



9. Simplify each fraction.

a) $\frac{48 \div 2}{100 \div 2} = \frac{24 \div 2}{50 \div 2} = \frac{12}{25}$ b) $\frac{12 \div 6}{42 \div 6} = \frac{2}{7}$ c) $\frac{24 \div 4}{28 \div 4} = \frac{6}{7}$ d) $\frac{40 \div 5}{25 \div 5} = \frac{8}{5}$

10. Solve each proportion.

a) $\frac{10}{15} = \frac{n}{3}$

$n = 10 \cdot 3 \div 15$

$n = (2)$

b) $\frac{5}{8} = \frac{25}{x}$

$x = 8 \cdot 25 \div 5$

$x = (40)$

c) $\frac{9}{2} = \frac{x}{7}$

$x = 9 \cdot 7 \div 2$

$x = (31.5)$

d) $\frac{x}{8} = \frac{7}{10}$

$x = 8 \cdot 7 \div 10$

$x = (5.6)$

key

PART 2

1. Ron made 9 out of 15 free throws and Jeff made 8 out of 12. Who made the greatest fraction of free throws? What was his shooting percentage?

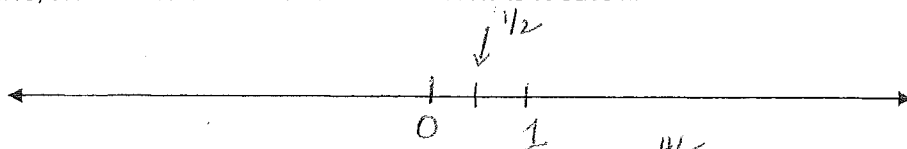
$$\frac{9}{15} = 0.6 \text{ or } 60\%$$

$$\frac{8}{12} = 0.67 \text{ or } 67\%$$

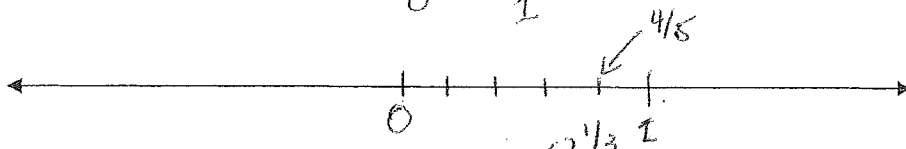
Jeff had higher percentage

2. On a numberline, show where each of the fractions is located.

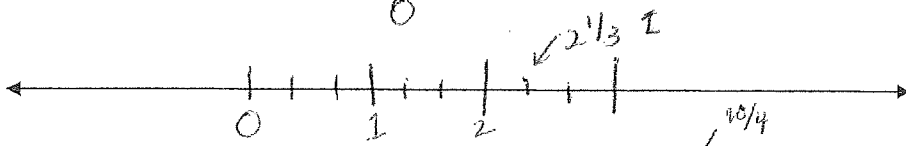
a) $\frac{1}{2}$



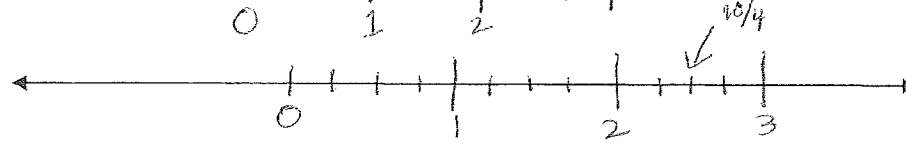
b) $\frac{4}{5}$



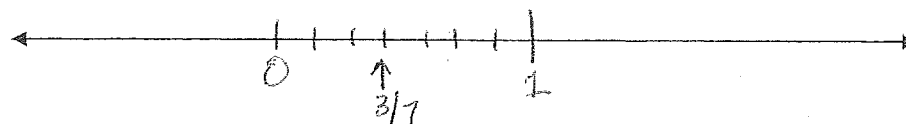
c) $\frac{7}{3}$



d) $\frac{10}{4}$



e) $\frac{3}{7}$



3. Perform the operation indicated.

a) $\frac{1}{5} + \frac{2}{5} = \left(\frac{3}{5}\right)$

b) $\frac{1}{3} + \frac{1}{4} =$

$$\frac{4+3}{12} = \left(\frac{7}{12}\right)$$

c) $1\frac{1}{2} + 2\frac{7}{10} =$

$$\frac{3}{2} + \frac{27}{10} = \frac{15+27}{10} = \frac{42}{10} = \left(\frac{21}{5}\right)$$

d) $\frac{3}{4} + \frac{5}{10} - \frac{1}{2} =$

$$\frac{15+10-10}{20} = \frac{15}{20} = \left(\frac{3}{4}\right)$$

e) $\frac{2}{3} \times \frac{1}{5} = \left(\frac{2}{15}\right)$

f) $\frac{4}{9} \times 1\frac{3}{4} =$

$$\frac{4}{9} \times \frac{7}{4} = \left(\frac{7}{9}\right)$$

g) $\frac{2}{5} \div \frac{1}{3} =$

$$\frac{2}{5} \times \frac{3}{1} = \left(\frac{6}{5}\right)$$

h) $3\frac{1}{2} \div \frac{3}{8} =$

$$3\frac{1}{2} \times \frac{8}{3} = \frac{28}{3}$$

$$i) \frac{1}{4} \left(\frac{7}{10} - \frac{3}{10} \right) =$$

$$\frac{1}{4} \left(\frac{4}{10} \right)$$

$$\left(\frac{1}{10} \right)$$

$$j) \frac{1}{5} + \frac{1}{2} \times \frac{3}{5} =$$

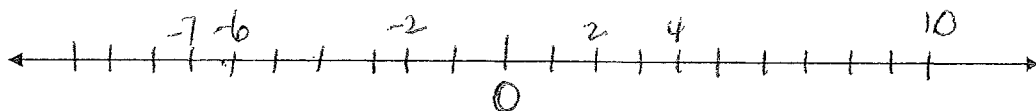
$$\frac{1}{5} + \frac{3}{10}$$

$$\frac{2+3}{10}$$

$$\frac{5}{10} \rightarrow \left(\frac{1}{2} \right)$$

4. Place the integers on the numberline.

-6, 2, 4, -2, 0, 10, -7



5. Compare the numbers using $>$ or $<$

$$6 \boxed{<} 12$$

$$9 \boxed{>} 0$$

$$-3 \boxed{<} 1$$

$$-4 \boxed{<} -2$$

6. Arrange from smallest to largest.

9, -12, 3, -5, 0, -9, 8, 24, -25

-25 -12 -9 -5 0 3 8 9 24

7. Perform the indicated operation.

$$a) 8 + (-6)$$

$$2$$

$$b) -11 + (-5)$$

$$-16$$

$$c) -14 + 9$$

$$-5$$

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

$$4$$

$$e) -8 - 9$$

$$-17$$

$$f) 10 - 14$$

$$-4$$

$$g) -6 - (-4)$$

$$-2$$

$$h) -12 - 8 - (-3)$$

$$-17$$

Part 3

1. Calculate:

a) $-6 + 10$

4

b) $5 - (-3)$

8

c) $(-2)(-3)$

+6

d) $-1 \times 5 + 10$

 $-5 + 10$

5

e) $-20(-6-4)$

 $-20(-10)$ $+200$

f) $[4 + 2 - 8 - 12 + 9] \cdot -2$

 $(-5) \cdot -2$ $+10$

g) $[-5 - 3 + 4 - 2] \cdot 0$

0

2. The temperature at 8 am was -4°C , at 2 pm the temperature was 5°C . What was the difference?

$$5 - -4 = 9$$

9°C warmer

3. Evaluate each expression.

a) $4c + a$

if $a = (-3)$

$c = (-5)$

$4(-5) + -3$

$-20 + -3$

 (-23)

b) x^2

if $x = -6$

$(-6)^2$

 $+36$

c) $2x - x^2$

if $x = -3$

$2(-3) - (-3)^2$

$-6 - 9$

 (-15)

d) $\frac{7-2a}{3}$

if $a = -5$

$\frac{7-2(-5)}{3}$

3

$\frac{7+10}{3}$

3

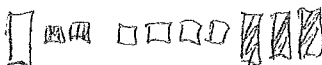
 $(\frac{17}{3})$

3. Model the following expressions using algebra tiles.

a) $-2 + 5$



b) $-x + 2 - 4 + 3x$



c) $x^2 - 4x + 3 + 2x - 1$



4. Simplify by collecting the like terms.

a) $10n + 5n$

$15n$

b) $2n + 7m - 4n - 9m$

$-2n - 2m$

c) $7y^2 - 12y - y + y^2 - 9y$

$8y^2 - 22y$

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

$-2x^2 + 8x$

e) $4(3x - 2)$

$12x - 8$

f) $5(2x + 4) - 3(x - 9)$

$10x + 20 - 3x + 27$

$7x + 47$

5. Fill in a number that makes a true statement.

a) $\boxed{7} + 3 = 10$

b) $6 - \boxed{2} = 4$

c) $3(\boxed{4}) = 12$

6. Solve each equation below. Show all of your work!

a) $x - 9 = 12$

$x = 21$

b) $x + 14 = 27$

$x = 13$

c) $x + 3 = -10$

$x = -13$

d) $x - 4 = -8$

$x = -4$

e) $5x = 15$

$x = 3$

f) $-2x = 22$

$x = -11$

g) $3x = 18$

$x = 6$

h) $-2x = 12$

$x = -6$

i) $2x - 4 = 12$

$x = 8$

j) $7x + 2 = 30$

$x = 4$

k) $5x - 8 = -23$

$x = -3$

l) $-3x - 2 = 43$

$x = -15$

m) $4(x + 3) = 20$

$x = 2$

n) $10 = 2(x - 7)$

$x = 12$

o) $5x + 2 = 4x - 10$

$x = -12$

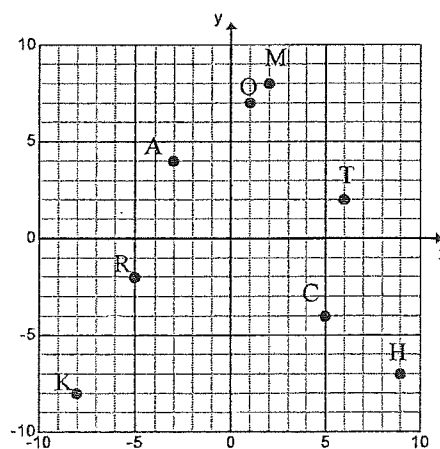
Part 4

1. Extend the linear pattern

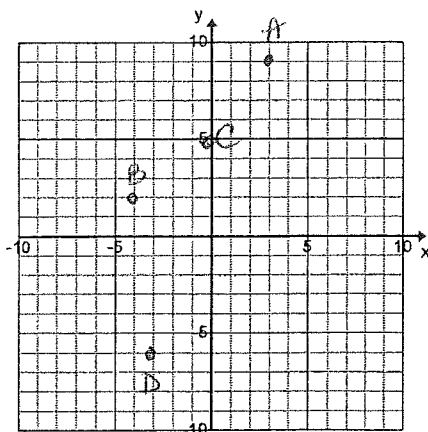
- a) 6, 9, 12, 15, 18, 21, 24
- b) 22, 17, 12, 7, 2, -3, -8
- c) -16, -10, -4, 2, 8, 14, 20
- d) 15, 7, -1, -9, -17, -25, -33

2. What are the coordinates?

- M (2, 8)
- A (-3, 4)
- T (6, 2)
- H (9, -7)
- R (-5, -2)
- O (1, 7)
- C (5, -4)
- K (-8, -8)



3. Plot the following points on the grid.



A (3, 9)

B (-4, 2)

C (0, 5)

D (-3, -6)

4. Fill in the table of values for each equation

$$Y = x + 1$$

$$y = 2x - 6$$

$$y = -3x$$

x	y	x	y	x	y
0	1	4	2	2	-6
1	2	3	0	-2	6
2	3	2	-2	1	-3
3	4	1	-4	-3	9

5. Given the scale factor, determine if it is an enlargement or a reduction.

$$SF = 9$$

enlargement or reduction

$$SF = 0.2$$

enlargement or reduction

$$SF = \frac{3}{4}$$

enlargement or reduction

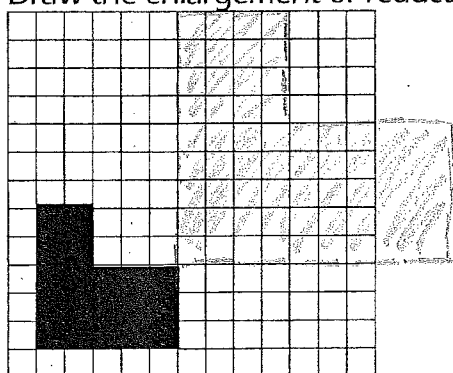
$$SF = 6$$

enlargement or reduction

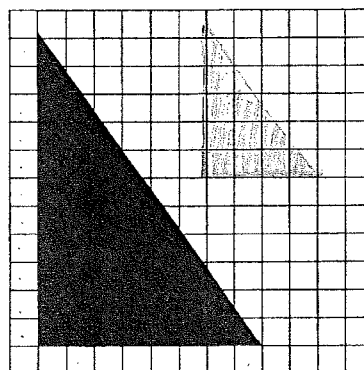
6. Fill in the scale factor chart

Original length	Scale factor	Image length
12 cm	2	24 cm
8 m	3	24 m
4.5 mm	0.5	2.25 mm
7 m	4	28 m
8.5 cm	2	17 cm
6 mm	0.5	3 mm

7. Draw the enlargement or reduction



Scale factor of 2

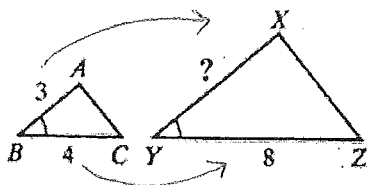


Scale factor of $\frac{1}{2}$

Part 5

1. Determine the missing side lengths in the similar shapes.

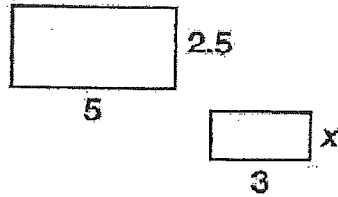
a)



$$\frac{\text{small } \Delta}{\text{big } \Delta} = \frac{4}{8} = \frac{3}{?}$$

The missing side is 6.

b)

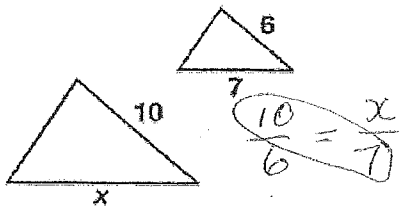


$$\frac{\text{small } \square}{\text{big } \square} = \frac{3}{5} = \frac{x}{2.5}$$

$$5x = 7.5$$

$$x = 1.5$$

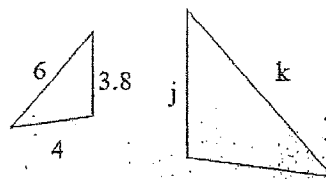
c)



$$x = 10 \cdot 7 \div 6$$

$$x \approx 11.7$$

d)



$$5 \cdot j = 9.5 \quad k = 15$$

$$\frac{k}{6}$$

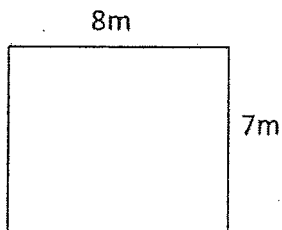
$$\left(\frac{10}{4} \right) \frac{j}{3.8}$$

$$j = 10 \cdot 3.8 \div 4$$

$$k = 6 \cdot 10 \div 4$$

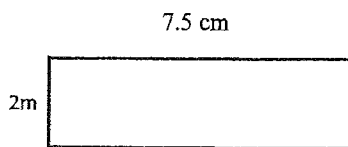
2. Determine the perimeter for each shape

→ add



$$\text{Perimeter} = \underline{30} \text{ m}$$

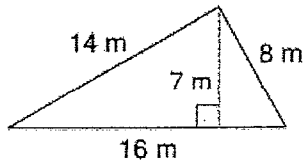
$$P = 8 + 7 + 8 + 7$$



$$P = 2(2 + 7.5)$$

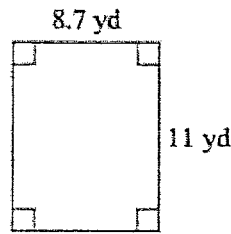
$$P = \underline{19 \text{ m}}$$

3. Determine the area for each shape



$$A = \frac{b \cdot h}{2} = \frac{16 \cdot 7}{2}$$

$$A = 56 \text{ m}^2$$



$$A = b \cdot h = 8.7(11)$$

$$A = 95.7 \text{ yd}^2$$

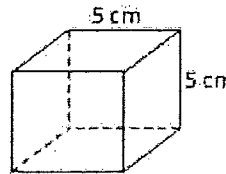
4. Calculate the surface area

$$16 \cdot 4 = 64$$

$$4 \cdot 2 = 8$$

$$72$$

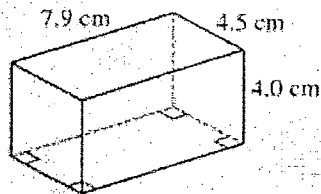
$$72 \text{ sq units}$$



$$A = 5 \cdot 5 = 25$$

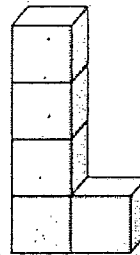
$$SA = 6(25)$$

$$SA = 150 \text{ cm}^2$$



$$SA = 2(7.9 \cdot 4.5) + 2(4.5 \cdot 4) + 2(7.9 \cdot 4)$$

$$SA = 170.3 \text{ cm}^2$$



$$SA = 5 \cdot 6 - 8$$

$$= 30 - 8$$

$$SA = 22 \text{ sq units}$$