UNITS 1,2: Integers, Graphing, and Relations

1. Fill in the blanks.   a) The y co-ordinate of (–5, 4) is _____.

            b) (–3, –7) lies in quadrant _____ .

2. Rewrite this list of integers in order from **smallest to largest**:   0, 15, –9, –13, 6, –10, –4

     _____, _____, _____, _____, _____, _____, _____

3. Evaluate. **Show all BEDMAS steps**.

a) $-6 + (-3) - (-7) - 4$ b) $-20 + 15 \div (-3)$ c) $3(-2 + 6)^2 - 2(-4 + 5)$
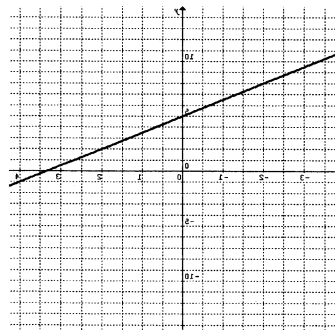
4. Evaluate the following for: $x = -2, \ y = -3$. **Show your substitution and steps.**

     $4y + x^3$

5. State whether each is **linear or non–linear**.

     a) $y = 2x^2 - 1$ b)

     _____   _____

6. a) Complete the following tables. For **Finite Differences**.
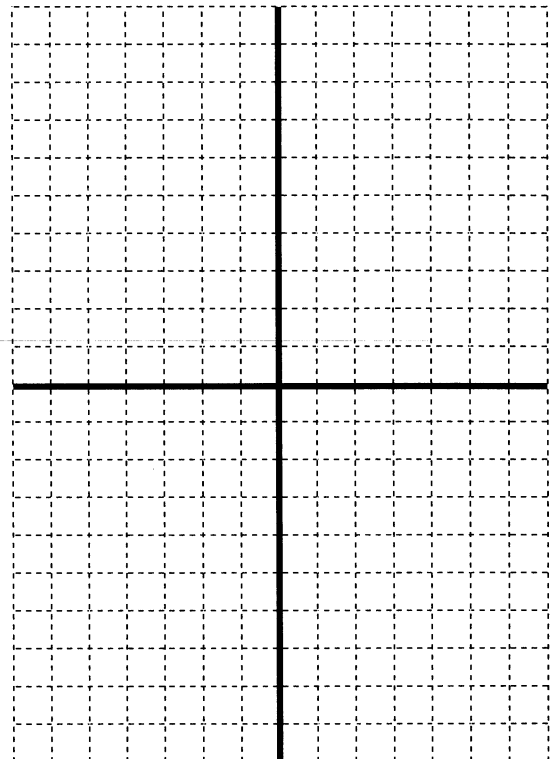   b) State the type of relation. (**Linear or Non–linear**)

i)

x	y	Difference in y–values
–3	–11	██
–2	–7	
–1	–3	
0	1	██

Type of Relation: _____

7. i) Complete the table of values.
   SHOW ALL OF YOUR WORK.
   ii) Graph on the grid provided. **Label the grid fully.**

$$y = x^2 - 5$$

x	y
3	
0	
–3	

UNIT 3: Algebra and Equations

1. Simplify.

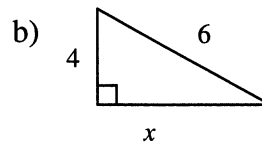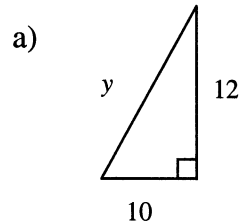a) $-6x - 7 + 5x - 4$

b) $-3(4 - 5x)$

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

2. Solve. **Show all steps.**

a) $-6x + 5 = -13$

b) $3x - 20 = 8 + 5x$

c) $-3(x-4)+2(x+3)=9-16$

3. Use the Pythagorean Theorem to determine the **length** of each unknown side. Round to 1 decimal place if necessary.

a)

y 12

10

b)

4   6

x

UNIT 4: Rational Numbers

1. Evaluate. *Leave your answer as a fractions in lowest terms*

a) $\dfrac{1}{3}+\left(-1\dfrac{2}{5}\right)$

b) $\dfrac{5}{7}\div\left(\dfrac{-3}{4}\right)$

c) $\left(\dfrac{5}{6}\right)^2$

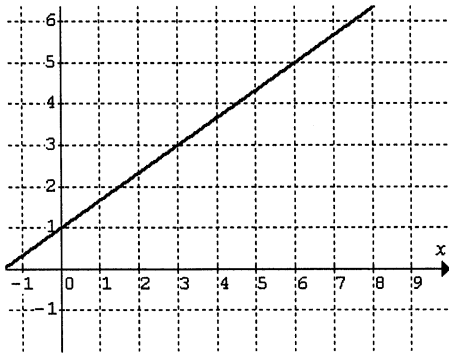# UNIT 5: Slope and Applications

1. Fill in the blanks.

a) If $y = \dfrac{-2}{3}x - 9$ state the y–intercept _____, and the slope _____.

b) If a line has a slope of 4 and a y–intercept is –5, write the equation. _____.

2. Find the slope of each of the following. *State the formula used.*

a)

b) $(6,-1)$ and $(-4,4)$

3. When taking a taxi, the cost ($) is determined according the formula $C = 3.5d + 7$ where C is the cost in dollars and d is the distance traveled in kilometers.
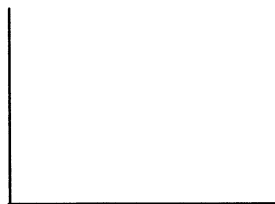
   a) State the slope with units. _____

   b) What does the slope represent in words? _____

   c) State the y–intercept with units. _____

   d) What does the y–intercept represent in words?_____

   e) Sketch a graph using slope and y–intercept.

UNIT 6: Geometry

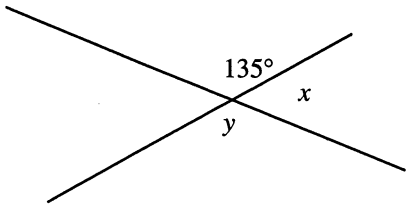1. Fill in the blanks.

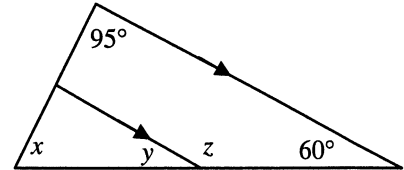   a) Opposite angles are _____.

   b) An obtuse angle is _____.

2. Determine the value of the unknown(s) in each diagram.

a)

135°

x

y

$x =$ _____ , $y =$ _____

b)

95°

x y z 60°

$x =$ _____

$y =$ _____

$z =$ _____
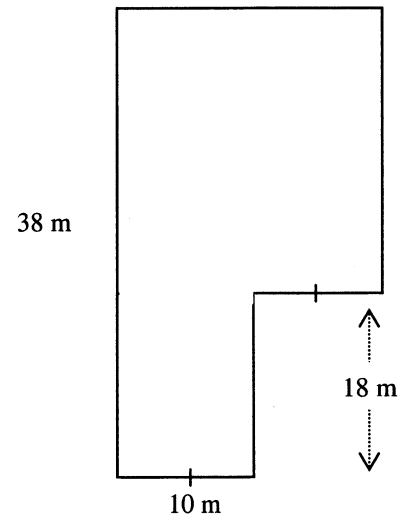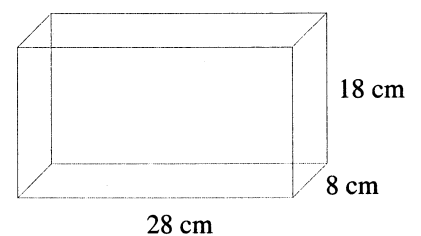
UNIT 7: Measurement

State any formula used.   Round all answers to 1 decimal place.
Use your π button or 3.14159   Include the correct units in your answer.

1. Determine the **area** and **perimeter** of the figure to the right.

38 m

18 m

10 m

2. Determine the **volume** of the figure to the right.

18 cm

8 cm

28 cm

UNIT 8: Ratios and Proportions and other stuff

Show full solutions as done in class

1. The ratio of boys to girls is 12:11 at Southwood Secondary School.
   How many girls are there if there are 421 boys? (Answer to the nearest girl)

2. In 5 minutes, a student can type 107 words. Suppose she continues at this rate.
   How many minutes does it take her to type 2500 words?

3. State the unit rate. Circle the one that is the fastest.

    A: 1250 km in 6.5 hours   B: 950 km in 5 hours

    Unit rate = _____   Unit rate = _____

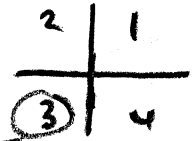4. A store is selling skates at a 30% discount. The regular price is $195

    a) Calculate the discount.   b) Calculate the sale price.

UNITS 1,2: Integers, Graphing, and Relations

1. Fill in the blanks. a) The y co-ordinate of $(-5, 4)$ is ___4___ .

                b) $(-3, -7)$ lies in quadrant ___3___ .

2. Rewrite this list of integers in order from **smallest to largest**: $0, 15, -9, -13, 6, -10, -4$

    ___-13___ , ___-10___ , ___-9___ , ___-4___ , ___0___ , ___6___ , ___15___ ,

3. Evaluate. *Show all BEDMAS steps*.

a) $-6 + (-3) - (-7) - 4$

$= -6 - 3 + 7 - 4$

$= -13 + 7$

$= -6$

b) $-20 + 15 \div (-3)$

$= -20 - 5$

$= -25$

c) $3(-2+6)^2 - 2(-4+5)$

$= 3(4)^2 - 2(1)$

$= 3(16) - 2(1)$

$= 48 - 2$

$= 46$

4. Evaluate the following for: $x = -2, \ y = -3$. *Show your substitution and steps.*

    $4y + x^3$

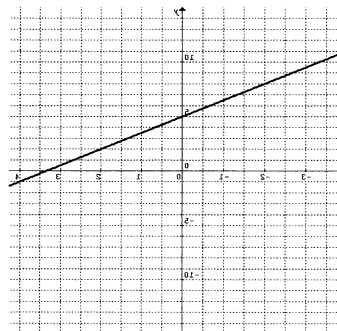$= 4(-3) + (-2)^3$

$= 4(-3) + (-2)(-2)(-2)$

$= -12 - 8$

$= -20$

5. State whether each is **linear or non–linear**.

a) $y = 2x^2 - 1$

    ___Non-linear___

b)

    ___linear___

6. a) Complete the following tables. For **Finite Differences**.
   b) State the type of relation. (**Linear or Non–linear**)

i)

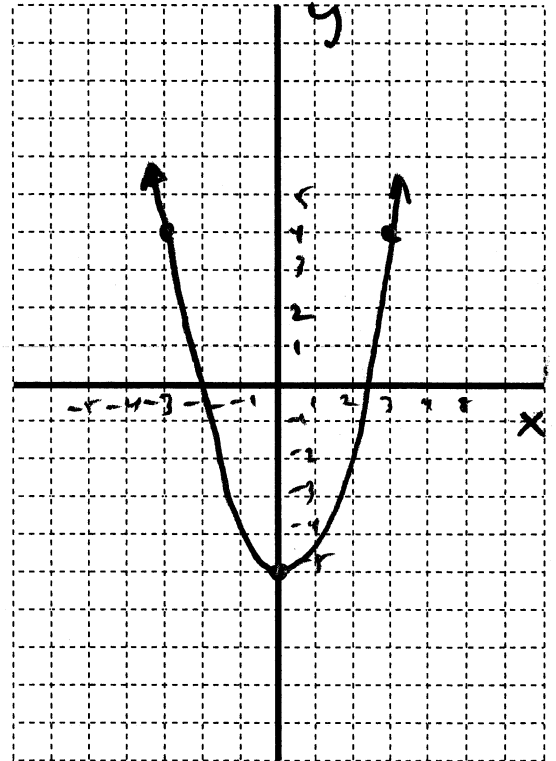| x	y	Difference in y–values
–3	–11	
		-4
–2	–7	
		-4
–1	–3	
		-4
0	1	

Type of Relation: __linear__

7. i) Complete the table of values.
   SHOW ALL OF YOUR WORK.
   ii) Graph on the grid provided. **Label your graph fully.**

$y = x^2 - 5$

x	y
3	4
0	-5
-3	4

$y = (3)^2 - 5 = 4$

$y = (0)^2 - 5 = -5$

$y = (-3)^2 - 5 = 4$

UNIT 3: Algebra and Equations

1. Simplify.

a) $-6x - 7 + 5x - 4$

$= -x - 11$

b) $-3(4 - 5x)$

$= -12 + 15x$

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

$= 3x - 3 - 8x - 4$

$= -5x - 7$

2. Solve. *Show all steps*

a) $-6x + 5 = -13$

$-6x + 5 - 5 = -13 - 5$

$\dfrac{-6x}{-6} = \dfrac{-18}{-6}$

$x = 3$

b) $3x - 20 = 8 + 5x$

$3x - 20 - 5x = 8 + 5x - 5x$

$-2x - 20 = 8$

$-2x - 20 + 20 = 8 + 20$

$-2x = 28$

$\dfrac{-2x}{-2} = \dfrac{28}{-2}$

$x = -14$

c) $-3(x-4)+2(x+3)=9-16$

$$-3x+12+2x+6=-7$$
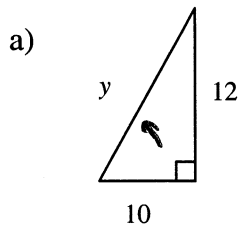
$$-x+18=-7$$

$$-x+18-18=-7-18$$

$$\frac{-x}{-1}=\frac{-25}{-1}$$

$$x=25$$

3. Use the Pythagorean Theorem to determine the **length** of each unknown side.
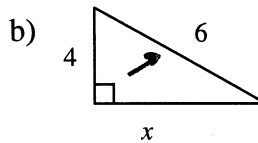   Round to 1 decimal place if necessary.

a)

$$h^2=a^2+b^2$$
$$h^2=10^2+12^2$$
$$h^2=244$$
$$h=\sqrt{244}$$
$$h=15.6$$

b)

$$h^2=a^2+b^2$$
$$6^2=4^2+x^2$$
$$36=16+x^2$$
$$36-16=16+x^2-16$$
$$20=x^2$$
$$\sqrt{20}=x$$
$$4.5=x$$

UNIT 4: Rational Numbers

1. Evaluate. *Leave your answer as a fraction. (No decimals!)*

a) $\dfrac{1}{3}+\left(-1\dfrac{2}{5}\right)$

$$=\frac{1^{\times5}}{3_{\times5}}+\frac{-7^{\times3}}{5_{\times3}}$$

$$=\frac{5}{15}+\frac{-21}{15}$$

$$=\frac{-16}{15}$$

b) $\dfrac{5}{7}\div\left(\dfrac{-3}{4}\right)$

$$=\frac{5}{7}\times\frac{4}{-3}$$

$$=\frac{20}{-21}$$

c) $\left(\dfrac{5}{6}\right)^2$
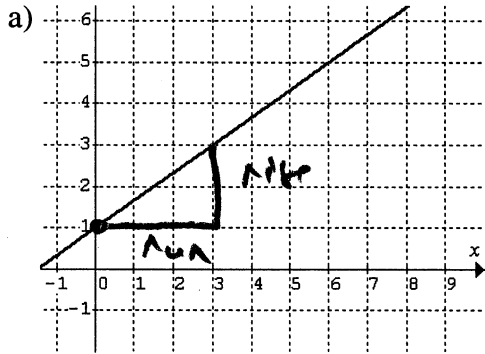
$$=\frac{5}{6}\times\frac{5}{6}$$

$$=\frac{25}{36}$$

UNIT 5: Slope and Applications

1. Fill in the blanks.

a) If $y = \dfrac{-2}{3}x - 9$ state the y–intercept ___ −9 ___, and the slope ___ $\dfrac{-2}{3}$ ___.

b) If a line has a slope of 4 and a y–intercept is –5, write the equation. ___ $y = 4x - 5$ ___.

2. Find the slope of each of the following:

a)

$$Slope = \frac{rise}{run} = \frac{2}{3}$$

b) $(6,-1)$ and $(-4,4)$

$$Slope = \frac{\Delta y}{\Delta x}$$
$$= \frac{(-1)-(4)}{(6)-(-4)}$$
$$= \frac{-5}{10} \div 5 = \frac{-1}{2}$$

3. When taking a taxi, the cost ($) is determined according the formula $C = 3.5d + 7$ where C is the cost in dollars and d is the distance traveled in kilometers.
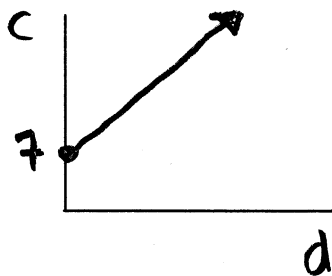
a) State the slope with units. ___ 3.50 \$/kilometre ___

b) What does the slope represent in words? ___ Cost per km driven ___

c) State the y–intercept with units. ___ \$7 ___

d) What does the y–intercept represent in words? ___ Starting cost for taking the taxi ___
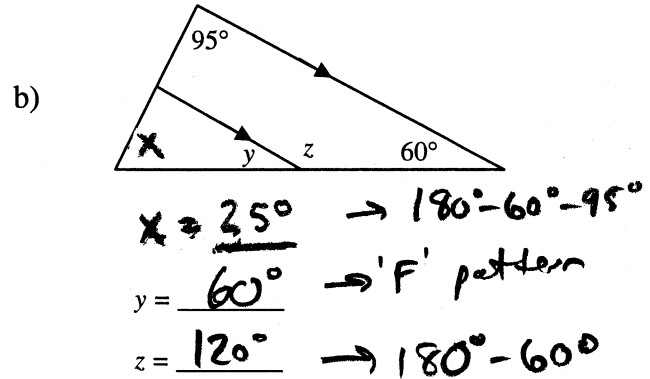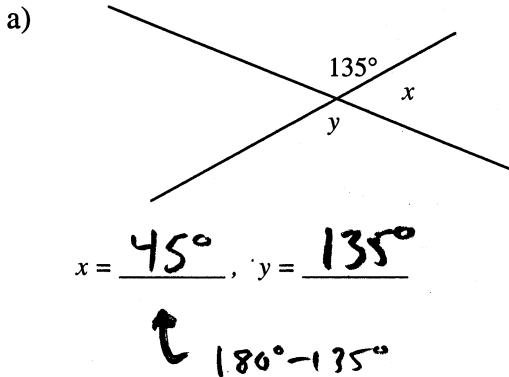
e) Sketch a graph using slope and y–intercept.

UNIT 6: Geometry

1. Fill in the blanks.

   a) Opposite angles are ___**equal**___.

   b) An obtuse angle is ___**bigger than $90°$, less than $180°$**___.

2. Determine the value of the unknown(s) in each diagram.

a)

$x = \underline{45°}$, $y = \underline{135°}$

↰ $180° - 135°$

b)

$x = \underline{25°} \rightarrow 180° - 60° - 95°$

$y = \underline{60°} \rightarrow$ 'F' pattern

$z = \underline{120°} \rightarrow 180° - 60°$
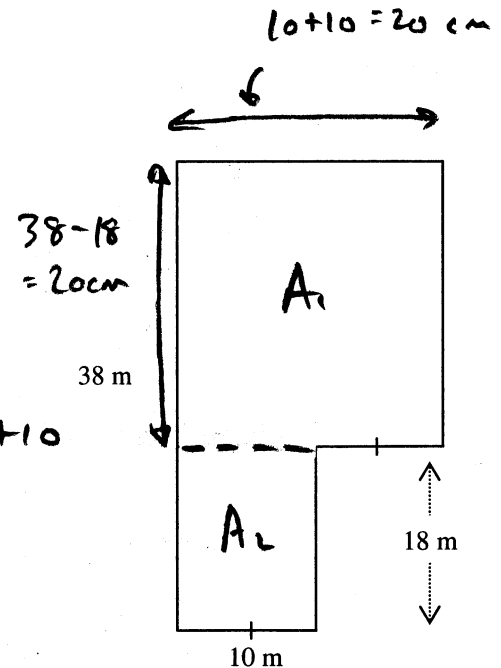
UNIT 7: Measurement

State any formula used.   Round all answers to 1 decimal place.
Use your π button or 3.14159   Include the correct units in your answer.

1. Determine the **area** and **perimeter** of the figure to the right.

$10 + 10 = 20$ cm

$A_1 = lw$

$A_1 = (20)(20)$

$A_1 = 400 \text{ m}^2$

$A_2 = lw$

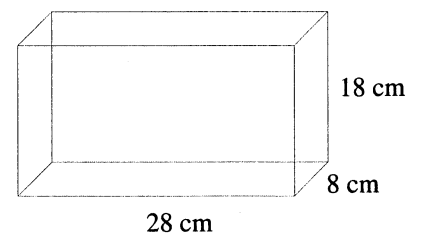$A_2 = (18)(10)$

$A_2 = 180 \text{ m}^2$

$A = 180 + 400$

$A = 580 \text{ m}^2$

$P = 38 + 20 + 20 + 10 + 18 + 10$

$P = 116 \text{ m}$

$38 - 18 = 20$ cm

2. Determine the **volume** of the figure to the right.

$V = lwH$

$V = (28)(8)(18)$

$V = 4032 \text{ cm}^3$

UNIT 8: Ratios and Proportions and other stuff

Show full solutions as done in class

1. The ratio of boys to girls is 12:11 at Southwood Secondary School.
   How many girls are there if there are 421 boys? (Answer to the nearest girl)

   boys : girls = boys : girls

   12 : 11 = 421 : x

   $$\frac{12}{11} = \frac{421}{x}$$

   $$(421)\frac{11}{12} = \frac{x}{421}(421)$$ → ∴ there are 386 girls

   385.9 = x

2. In 5 minutes, a student can type 107 words. Suppose she continues at this rate.
   How many minutes does it take her to type 2500 words?

   min : words = min : words

   5 : 107 = X : 2500

   $$(2500)\frac{5}{107} = \frac{x}{2500}(2500)$$ → it will take her 116.8 minutes

   116.8 = x

3. State the unit rate. Circle the one that is the (fastest.)

   (A: 1250 km in 6.5 hours)   B: 950 km in 5 hours

   Unit rate = __192.3 km/hour__   Unit rate = __190 km/h__

4. A store is selling skates at a 30% discount. The regular price is $195

   a) Calculate the discount.   b) Calculate the sale price.

   30% of $195   195 − 58.50

   ↓ ÷100 ↓   = 136.5

   = 0.30 × $195   ∴ sale price is $136.50

   = 58.5

∴ discount is $58.50