

Level 6 Summer Review

1) Simplify

$-7(6 + 3) + 3v + 10v$	$-10(-6 - 9) + 3v + 10v$	$10 - 10(-6 - 3v) + 2v$

2) Simplify

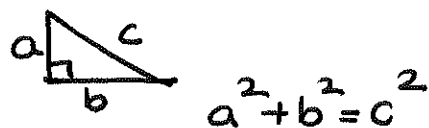
$-1(-10 - 3) - 5v - 9v$	$5 - 3(1 - 6v) + 4v$	$-2 + 2(-2 - 7v) - 9v$

3) Ron drew a square with each side being exactly 12 centimeters long. If he wanted to make the ^{side} ~~square~~ 6% _{larger} what will be the side of the new square?

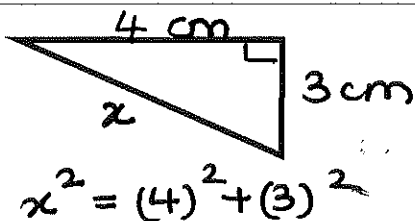
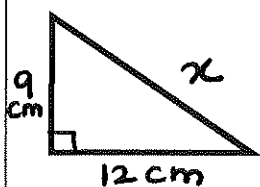
4) A company was having a sale for 17% off the price of TV's. How much money you would save if you bought 25 monitors originally priced at \$500 each?

5) A mall kiosk needed to buy 45 new cell phone cases originally priced at 30 dollars apiece. Because they were buying so many they got 15% off the price. How much did they pay in all?

6) Over the spring gas prices dropped 2%. Which expression shows the new price of a gallon of gas? (the old price is represented by p)

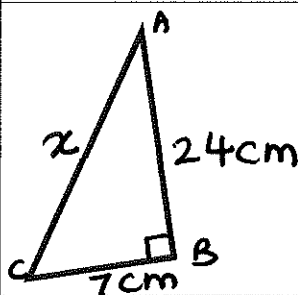
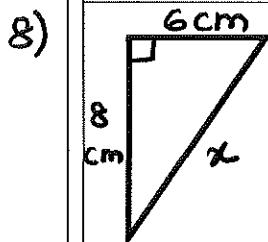


7) Find the unknown side



$x =$

$x =$



$x =$

$x =$

9) Solve C1 C2 C3

$x^3 = 64$

$x^2 = 64$

$x^2 = 100$

a)

$x^3 = -1000$

$x^2 = 1000$

$x^3 = 1000$

b)

$x^3 = -81$

$x^2 = 81$

$x^2 = -81$

c)

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- 10) a) 8×10^8 is _____ times the value of 2×10^9 .
- b) 42×10^3 is _____ times the value of 6×10^4 .
- c) 42×10^8 is _____ times the value of 6×10^2 .
- d) 4×10 is _____ times the value of 4×10^2 .

	Simplify C1	C2
a)	$(7 \times 10^4) \times (6 \times 10^5)$	$(3 \times 10^1) \times (8 \times 10)$
b)	$(7 \times 10^{-4}) \times (6 \times 10^5)$	$(3 \times 10^{-1}) \times (8 \times 10)$
c)	$(7 \times 10^4) \times (6 \times 10^{-5})$	$(3 \times 10^{-4}) \times (8 \times 10^{-1})$

- 12) 56 meters of cloth is required to make 25 shirts. How much cloth is required to make 35 shirts of the same size?

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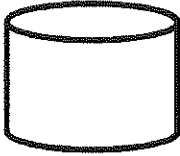
(Express in Scientific notation)

	Simplify	C1	C2
13) a)		$(7.7 \times 10^8) \times (6.9 \times 10^5)$	$(3.2 \times 10^3) \times (5.8 \times 10^{10})$
b)		$(7.7 \times 10^{-8}) \times (6.9 \times 10^5)$	$(3.2 \times 10^{-3}) \times (5.8 \times 10^{10})$
c)		$(7.7 \times 10^8) \times (6.9 \times 10^{-5})$	$(3.2 \times 10^3) \times (5.8 \times 10^{-10})$

14) A typist takes 1 hour 45 minutes to type 24 pages. How long will he take to type 64 pages?

15) If $\frac{8}{15}$ of a cargo is worth \$600. What is the cost of $\frac{2}{3}$ of the cargo?

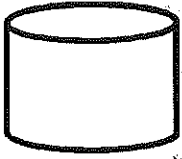
16) Find the volume of a cylinder whose diameter of the base is 20 cm and the height is also 10 cm [Volume of cylinder = $\pi R^2 H$ and $\pi = 3.14$]



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17)

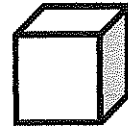
Find the volume of a cylinder whose radius of the base is 10 cm and the height is 15 cm [*Volume of cylinder = $\pi R^2 H$ and $\pi = 3.14$*]



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18)

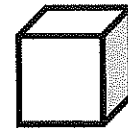
What is the volume and the total surface area of a cube with each side length 5 cm



Volume	TSA
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19)

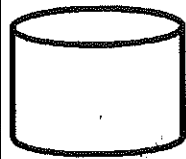
What is the volume and the total surface area of a cube with each side length 0.8 cm



Volume	TSA
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20)

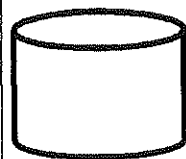
Find the volume of a cylinder whose radius of the base is 2 cm and the height is 1 cm [*Volume of cylinder = $\pi R^2 H$ and $\pi = 3.14$*]



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21)

Find the volume of a cylinder whose radius of the base is 3 inches and the height is 8 inches [*Volume of cylinder = $\pi R^2 H$ and $\pi = 3.14$*]



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22) Find the value without using a calculator

a)	$0.125 * 0.3$	$0.125 * 0.5$
	<input type="text"/>	<input type="text"/>
b)	$0.125 * 0.004$	$0.125 * 2$
	<input type="text"/>	<input type="text"/>
c)	$0.125 * 0.04$	$0.125 * 200$
	<input type="text"/>	<input type="text"/>

23) Simplify using Laws of exponents

	C2	C3	
a)	$m^3 n^5 \times m^5 n^2$	$4x^3 \div 2x$	$(2xy)(3x)^2$
	<input type="text"/>	<input type="text"/>	<input type="text"/>
b)	$\frac{x^3 y^5 z^5}{xyz}$	$(14)^P \div (7)^P$	$\frac{15m^2 n^3}{60mn^5}$
	<input type="text"/>	<input type="text"/>	<input type="text"/>
c)	$(100)^{100} \div (25)^{100}$	$(10)^2 \times \left(\frac{1}{2}\right)^2$	$(2^0)^3 \div (2)^2$
	<input type="text"/>	<input type="text"/>	<input type="text"/>

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24) Find the value of.

	C1	C2
a)	$0.2 \times 10^5 + 3.5 \times 10^5$	$5.2 \times 10^5 - 3.2 \times 10^5$

b)	$6 \times 10^{-2} + 4 \times 10^{-2}$	$6 \times 10^{-2} - 4 \times 10^{-2}$

c)	$8 \times 10^3 + 1 \times 10^3$	$8 \times 10^3 - 1 \times 10^3$

25) Find a number which when increased by 10% becomes 66.

26) Find a number which when increased by 15% becomes 207.

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Simplify using Laws of exponents			
	C2	C3	
27)	$(3)^9 \times (3)^{-6}$	$-49 \times (7)^{-2}$	-60×6^{-1}
a)			
b)	$(-2)^{-2} \times (3)^{-1}$	$(2)^{-1} \times (3)^{-1} \times (5)^{-2}$	$(2)^{-2} \times (4)^2 \times (2)^{-1}$
c)	$(50)^{-6} \times (50)^{12}$	$(2)^5 \times (2)^{-6} \times (2)^3$	$(3)^{-1} \times 9$
d)	$(-3)^{-3} \times (2)^{-3}$	$(10)^{-23} \times (10)^{23}$	$(0.5)^{10} \times (0.5)^{-10}$
e)	$(-3n) \times (-3n)$	$(5n) \div (2n^{-2})$	$4y^2 \times 3y^{-2}$

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28) Simplify using Laws of exponents

a)	$(-6a^{-2}) \div (4a^{-4})$	$9b^4 \times 9b^{-8}$
b)	$-\frac{1}{2}x^3 \times x^4$	$(-1000)^0 \div (3)^0$
c)	$z^2 \times 3(z)^{-3} \div (-6)z^{-2}$	$(-3)^{100} \times \frac{-5}{(6)^{100}} \times (-2)^{100}$

29) Find the value of

a)	$3.56 \times (10)^n = 356$	$0.23 \times 10^3 = n$
b)	$n \times 10^5 = 6541$	$n \times \frac{1}{10^5} = 0.34$
	$n =$	$n =$

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30) Find a number which when decreased by 8% becomes 115.

31) Find a number which when decreased by 13% becomes 261.

32) By what number should a given number be multiplied to increase its value by 20%	By what number should a given number be multiplied to decrease its value by 30%
<input type="text"/>	<input type="text"/>

33) The price of a washing machine increased from \$860 to \$989. What was the percent increase in the price?

34) On increasing Anum's salary by 12%, her monthly salary will increase by \$1158. What was her original salary?

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35)	<u>C1</u>	<u>C2</u>
	what percent of 250 is 15	what percent of 12 is 0.12
	<input style="width: 150px; height: 30px;" type="text"/>	<input style="width: 150px; height: 30px;" type="text"/>

36)	Find the value of	
	<u>C1</u>	<u>C2</u>
a)	$n \times 10^{-4} = 0.000104$	$9.2 \times n = 0.0092$
	$n =$	$n =$
b)	$7.24 \times 10^n = 0.00724$	$5 \times 10^n = 0.005$
	$n =$	$n =$

37)	Simplify $(2x^2 + 3x - 6)(5 + 3x)$
	<input style="width: 350px; height: 40px;" type="text"/>

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38)

Name all the quadrilaterals below that have the following properties

Quadrilateral	Trapezoid	Isosceles Trapezoid		Parallelogram
Square	Rhombus	Kite	Rectangle	

a) Diagonals are congruent

b) Diagonals bisect each other

c) Diagonals are perpendicular to each other

d) Opposite sides are congruent

e) Opposite sides are parallel

f) Opposite angles are congruent

39)

Simplify

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

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40)

The store purchased a scooter for \$6500. At what price should they sell the scooter to make a profit of 15%

41)

Sam bought 70 liters of lemonade concentrate at \$15 per liter and sold it all for \$1260. Did she make a profit or loss in the transaction and by how much?

42)

Draw the following angles using a protractor

(Also draw the angle bisector)

$\angle ABC = 90^\circ$	$\angle PQR = 125^\circ$	$\angle XYZ = 42^\circ$
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43)

Construct the following triangles

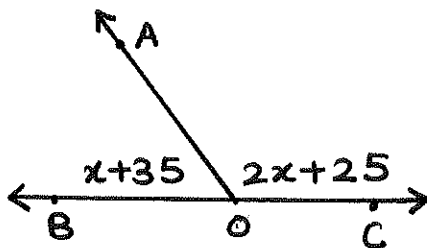
a) $\triangle ABC$ is an equilateral triangle with each side 4.2 cm

b) $\triangle PQR$ is an equilateral triangle with each side 3.8 cm

44)

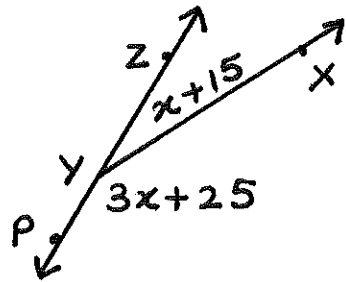
Find x

C1



$x =$

C2



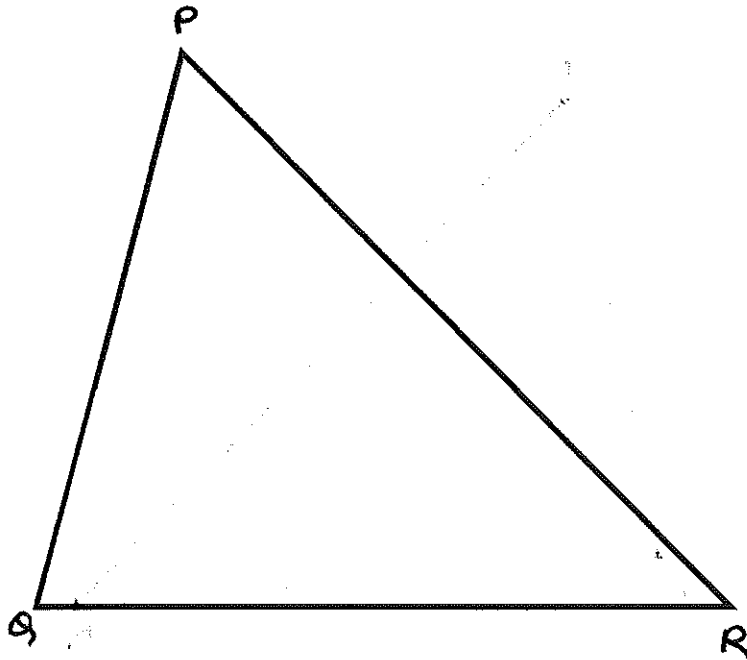
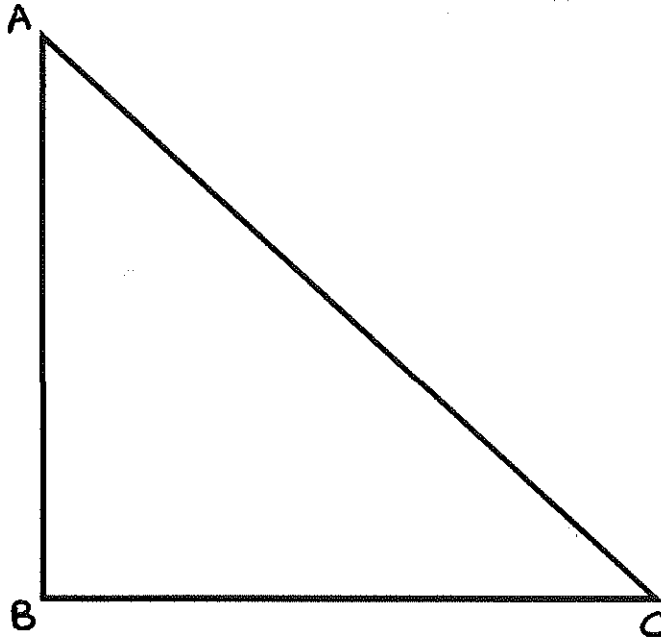
$x =$

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45) Draw the angle bisectors to all the three angles of the given triangles

Important:

(The point of intersection of the angle bisectors of a triangle is called the incenter)



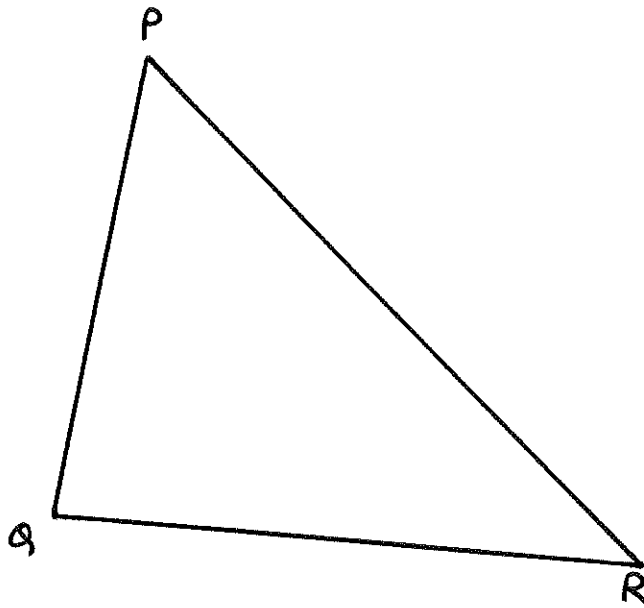
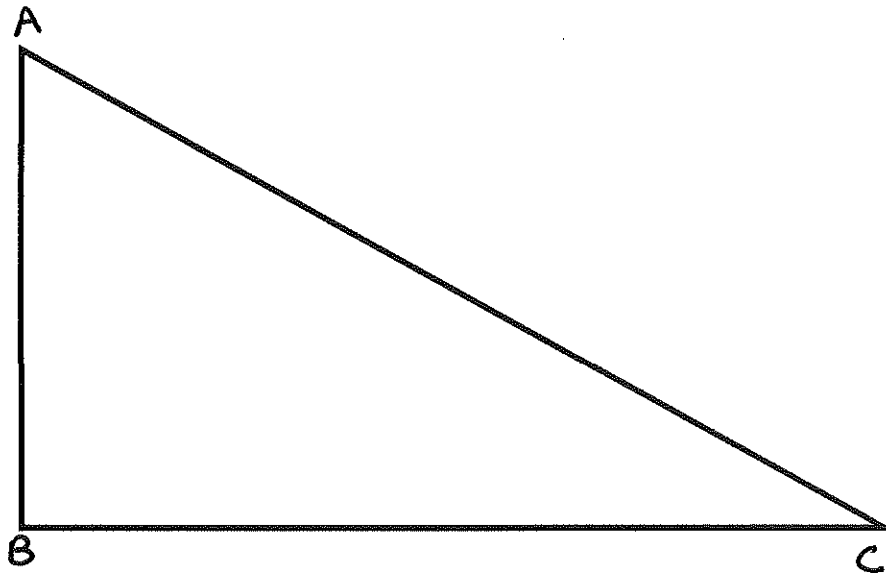
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46)

Draw the perpendicular bisectors to all the three sides of the given triangles

Important:

(The point of intersection of the perpendicular bisectors of a triangle is called the circumcenter)



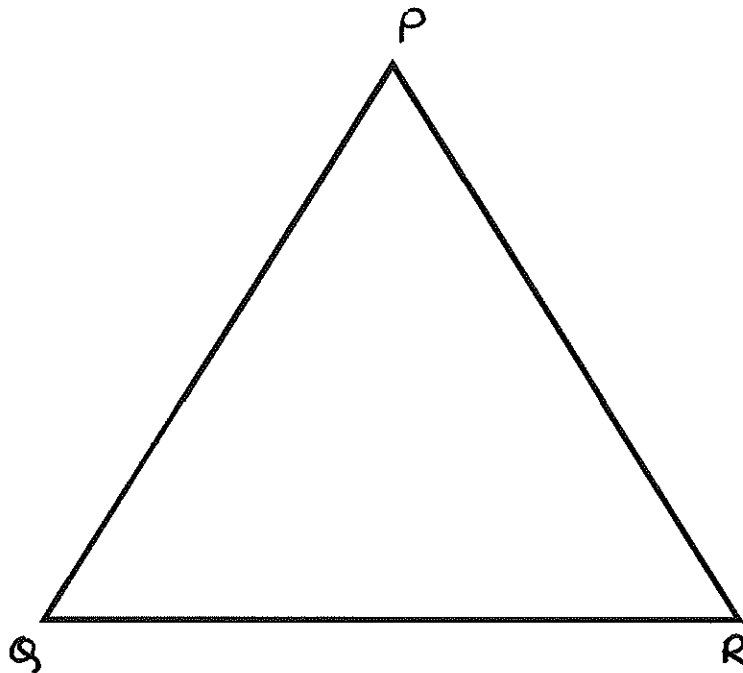
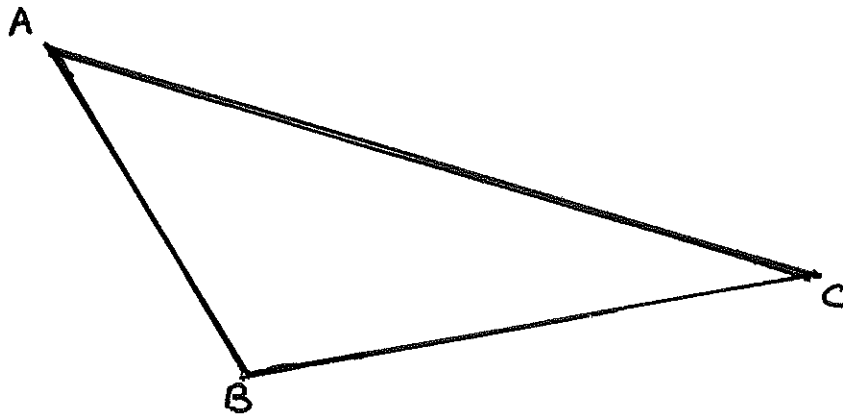
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Draw the medians to all the three sides of the given triangles

47)

Important:

(A median is a segment joining the vertex of a triangle with the midpoint of the opposite side. The point of intersection of the medians of a triangle is called the Centroid).



48)

Draw the following (Hint: Always draw a rough figure first)

1. ΔABC such that $AB = 3\text{cm}$, $BC = 4\text{cm}$, $AC = 5\text{cm}$

2. ΔLMN such that $LM = 4.3\text{cm}$, $MN = 7\text{cm}$, $NL = 4.3\text{cm}$

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49) Two supplementary angles are in the ratio **4:5**. Find the measure of the smaller angle.

50) Two supplementary angles are in the ratio **7:8**. Find the measure of the smaller angle.

51) If 16 men can reap a farm in 30 days, how many days will 20 men take to reap the same farm at the same rate?

52) 30% of the total candidates failed a test. If 336 candidates passed the test, how many students took the test?

53) Fill in the blanks

a) The product of a rational number and its reciprocal is _____

b) The sum of a rational number and its opposite is _____

c) A cube is a rectangular prism with all its sides _____

d) A rectangular prism has _____ faces, _____ vertices and _____ edges.

e) 0.3 expressed as a fraction is _____

54)	Identify if a polynomial (Yes / No). If Yes, State the degree of the polynomial	Yes / No	Degree =
a)	$(\frac{4}{3})x^2 - 5x + 17$		
b)	$8x^2 - 4x - 6\sqrt{x} - 1$		
c)	$5x^2 - (\frac{2}{x}) + 3$		
d)	$4x^3 - 3xy^2 - y^3z$		
e)	$ab^2 - (\frac{7}{a^2})$		
f)	$(\frac{4}{3})x^2y^2$		

55) Simplify

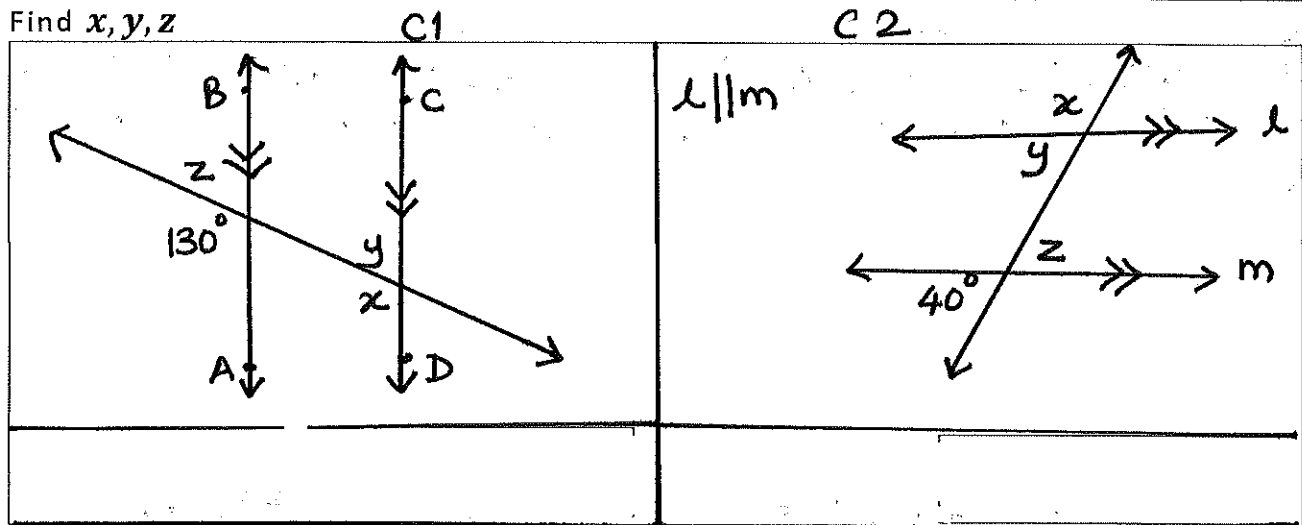
1) $(2x + 9y - 7z) + (3y + z - 3x)$

2) $(2x - 9y + 7z) - (3y - z + 3x) - (2y - x)$

3) $(\frac{2}{3})x^2 - 5x^2 - (\frac{1}{4})x^2 + 6x^2 + (\frac{1}{4})x^2$

56)

Find x, y, z



57)

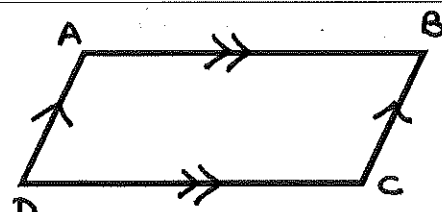
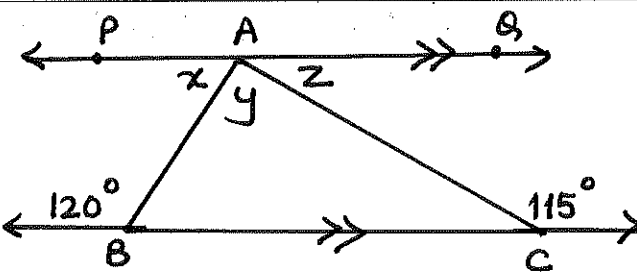
Simplify

1) $(3x^3 + 2x^2 - 6x + 3) - (2x^3 - 3x^2 - 4) + (2x - 4x^2)$

2) $(3z^3 - z^2 + 5) - (1 - 2z + z^2) + (3 + 2z - z^3)$

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

58)	Simplify	C1	C2
	a)	$\left(-\frac{18}{5}x^2z\right)\left(-\frac{25}{6}xz^2y\right)$	$\left(\frac{2}{5}x^2y\right)\left(-15xy^2z\right)\left(-\frac{1}{2}z^2\right)$
b)		$\left(-\frac{3}{4}xy^3\right)\left(-\frac{2}{3}x^2y^4\right)$	$\left(\frac{1}{4}ab\right)\left(-6b^2\right)\left(-\frac{1}{3}c\right)$

59)	Find the measure of the unknown angles	C2
	 <p>□ ABCD is a Parallelogram</p> <p>$\angle D = 2x + 45^\circ$</p> <p>$\angle C = 3x + 15^\circ$</p>	 <p>$PQ \parallel BC$</p>
	$\angle B =$	$x =$ $y =$ $z =$

60)

Find the value of the variable C1

$$\frac{(8-3x)}{(5+3x)} = \frac{2}{3}$$

C2

$$\frac{(2x+3)}{(3+x)} = \frac{3}{2}$$

61)

$$(2-3x) > (5-x)$$

where x is an integer

$$-2(5x+3) > 7$$

where x is a Natural #

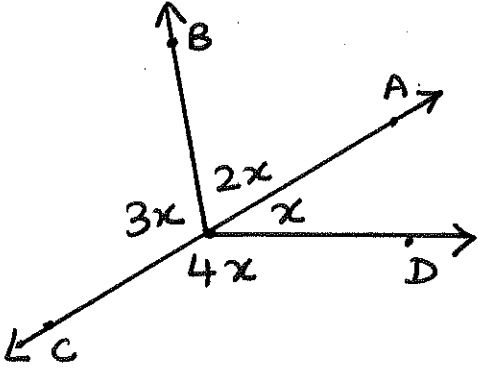
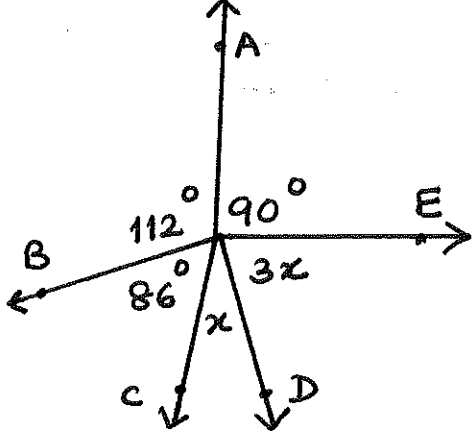
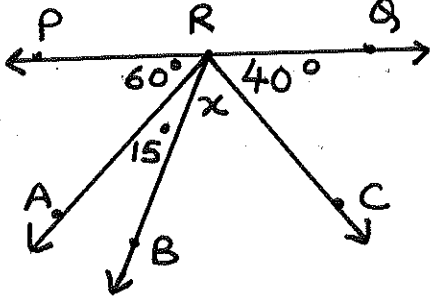
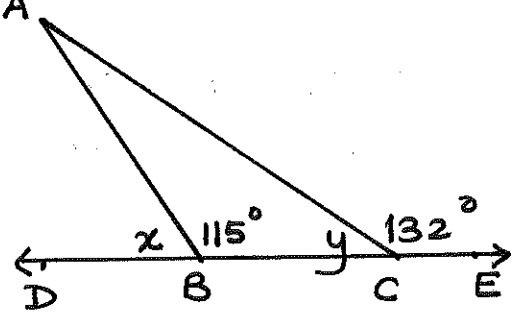
62)

$$-2(2x+1) < 14$$

where x is an integer

$$-2x + 4 > 16$$

where x is a whole #

63)	a)	<p style="text-align: center;">Find x C1</p>  <div style="border: 1px solid black; width: 100%; height: 30px; margin-top: 10px; text-align: center; padding: 5px;">$x =$</div>	<p style="text-align: center;">C2</p>  <div style="border: 1px solid black; width: 100%; height: 30px; margin-top: 10px; text-align: center; padding: 5px;">$x =$</div>						
63)	b)	 <div style="border: 1px solid black; width: 100%; height: 30px; margin-top: 10px;"></div>	 <div style="border: 1px solid black; width: 100%; height: 30px; margin-top: 10px; display: flex; justify-content: space-around;"> x y </div>						
64)	<p>Find the sum of all angles of</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 33%; padding: 5px;">Nonagon</td> <td style="width: 33%; padding: 5px;">dodecagon</td> <td style="width: 33%; padding: 5px;">20 sided polygon</td> </tr> <tr> <td style="height: 150px;"></td> <td></td> <td></td> </tr> </table>			Nonagon	dodecagon	20 sided polygon			
Nonagon	dodecagon	20 sided polygon							

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65)

Fill in the blanks

- a) A simple closed figure bounded by three or more sides is called a

- b) A line segment joining the non-adjacent sides vertices of a polygon is called
the _____
- c) If two geometric figures have the same shapes and size they are called

- d) A segment joining the vertex of a triangle to the midpoint of its opposite side
is called _____
- e) A perpendicular drawn from the vertex of a triangle to the opposite side is
called _____
- f) A ray that cuts an angle into two equal parts is called _____
- g) The point of intersection of the three angle bisectors of a triangle is called the

- h) The point of intersection of the three medians of a triangle is called the

- i) The greatest number that divided each of the given numbers exactly is called

- j) The least number which is divisible by each of the given numbers exactly is
called _____
- k) The product of HCF and LCM = _____

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66) Find the greatest number that divides 513, 1134 and 1215 exactly

67) Find the greatest number which divides 77 and 121 to leave the remainder 8 and 6 respectively?

68) Find the greatest number which divides 645 and 790 to leave the remainder 7 in each case?

69) A drum of water is $\frac{3}{7}$ th full. When 28 liters of water is drawn from it, it is just $\frac{5}{14}$ th full. Find the total capacity of the drum in liters

70) The product of two fractions is 7. If one of them is $18\frac{1}{5}$, find the other number

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71) 60% of 80 is what percent of 40% of 180 (round to the nearest tenth)

72) Simplify : $\sqrt[3]{1512}$

73) Find the value of : $-\left[\frac{1}{2}\right] * -\left[\frac{2}{3}\right] * -\left[\frac{3}{4}\right] * -\left[\frac{4}{5}\right] * \dots \dots -\left[\frac{99}{100}\right]$

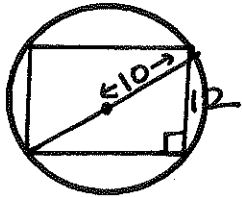
74) What is the length of the hypotenuse of a right angled triangle with the two other sides 5 cm and 12 cm

75) What is the area of a circle whose circumference is π cm

76) A stack of CD's fit perfectly in a cylindrical container. Each CD has a circumference of 10π cm and a thickness of 3 mm. Find the volume of a stack of 50 CD's

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- 77) A rectangle is inscribed in a circle of radius 10 inches. If one of the rectangles sides measures 12 inches, what is the perimeter of the rectangle?



- 78) find x if $(2x + 2)$, $(6x - 2)$ and $(10 - 6)$ are equal numbers

- 79) The sum of 3 consecutive even numbers is 2010. What is the smallest number?

- 80) The number of boys at a school is $\frac{2}{3}$ the number of girls. $\frac{1}{4}$ of the girls wear glasses and $\frac{1}{8}$ of the girls who wear glasses have braces. If 3 girls have glasses and braces how many students are in the school?

- 81) A backyard is 1300 square feet. 12% of the yard is occupied by a trampoline. What will be the diameter of the largest circular trampoline? Diameters of the trampoline come in whole numbers. ($\pi = 3.14$)

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82) Anna invested \$6500 for 2.25 years at 4% per year at simple interest. How much was the total amount she recovered at the end of the full term?

Challenge 2
83) By how much percent will the area of a square increase by if the side of the square is increased by 20%

Challenge 2
84) Anna can finish a work by herself in 8 days and Ben can finish it in 4 days working alone. If both Anna and Ben work together, how much part of the work will they have completed in 2 days?

Challenge 2
85) Faucet A, alone fills a tank in 3 hours and faucet B alone can fill the tank in 2 hours. How many hours will both the faucets open fill the whole the tank?

86) The volume of a cube is 512 cubic cm. what is the length of each side?

87) 88 meter long wire is bend in the shape of a circle. Find the area of the circle.

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88) If a number is increased by 5 times itself, the result is 144. Find the number?

89) At what rate percent will \$800 amount to \$1000 in 2 years if invested at simple interest?

90) Solve: $5(3x + 4) - 8(6x - 7) < 9x - 8$

91) The interior angle of a regular polygon is 11 times its exterior angle. How many sides does the polygon have?

Challenge question

92) The average weight of 4 people is 67 kilograms. When a fifth person joins in the average weight is reduced by 2 kilograms. What is the weight of the fifth man?

Pg (30)

Level 6 Summer Review 2015-16

93) 15% is to be added to a \$120 pair of shoes. Find the total price.

94) If you roll a die 90 times, about how many times would you expect to roll a 4?

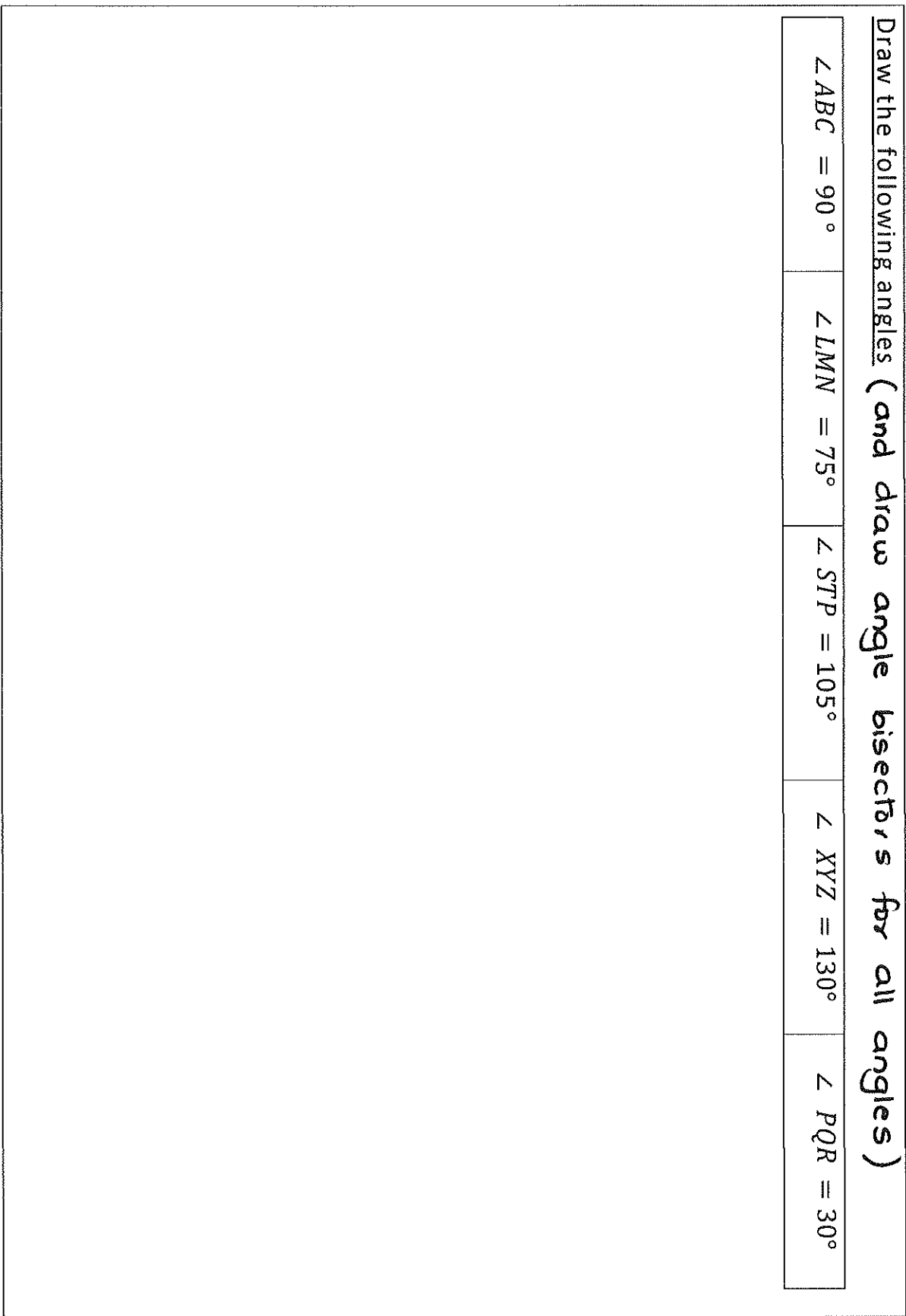
95) find the value of $x^0 * x^2 * x^1 * x^{-7}$

96) Solve: 4 to the power of 14 multiplied by 4 to the power of -20

97) A cereal box has a length of 8 inches, a width of $1\frac{3}{4}$ inches, and a height of $12\frac{1}{8}$ inches. What is the volume of the cereal box?

q8) Draw the following angles (and draw angle bisectors for all angles)

$\angle ABC = 90^\circ$	$\angle LMN = 75^\circ$	$\angle STP = 105^\circ$	$\angle XYZ = 130^\circ$	$\angle PQR = 30^\circ$
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99)

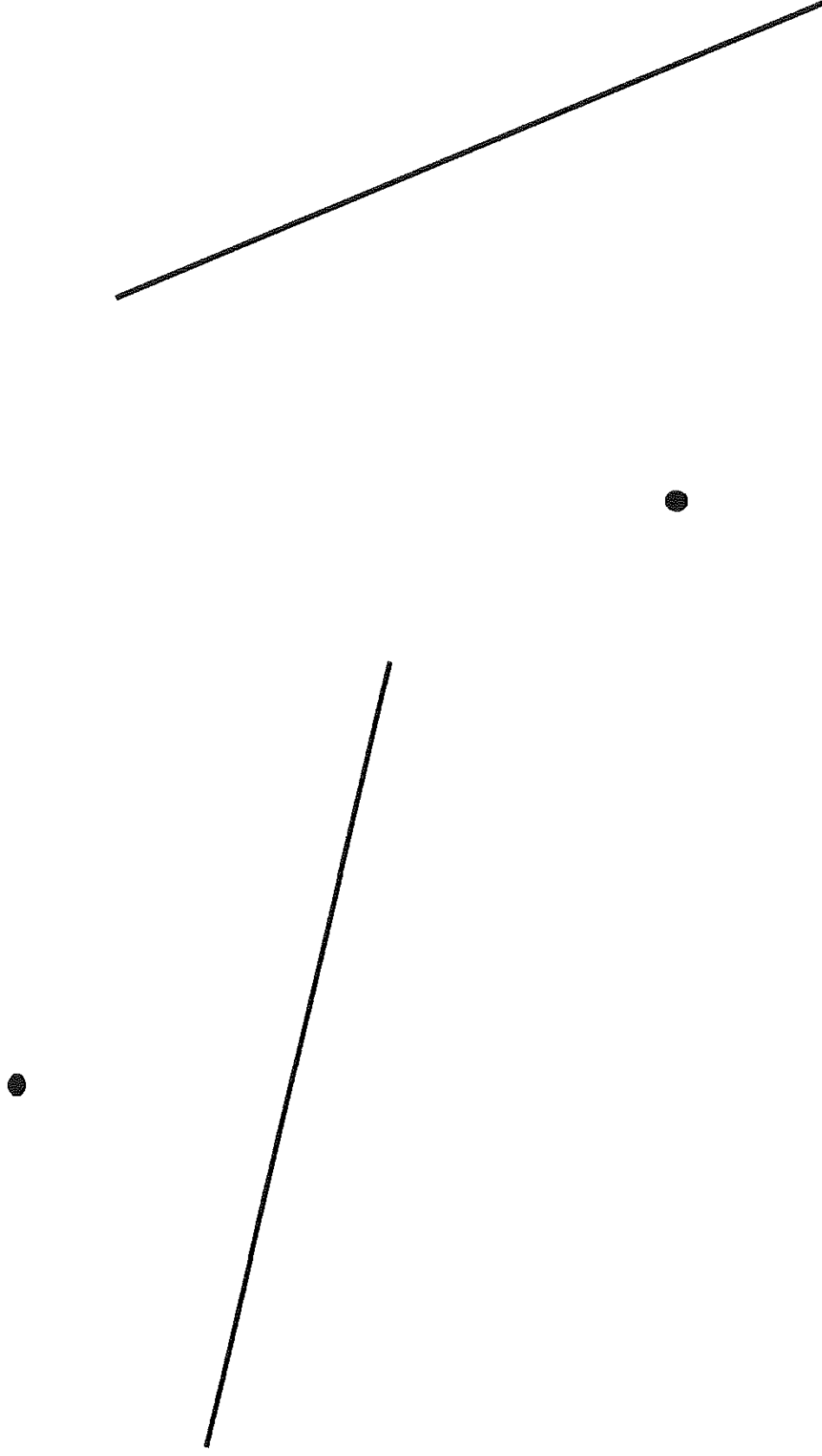
Using a compass and a ruler, construct the following

- a) Draw segment $AB = 7.1$ cm and draw a perpendicular bisector to it.
- b) Draw segment $XY = 4.3$ cm and draw a perpendicular bisector to it.

Pg (33)

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(00) Draw a perpendicular (Altitude) to segment from the point outside the segment

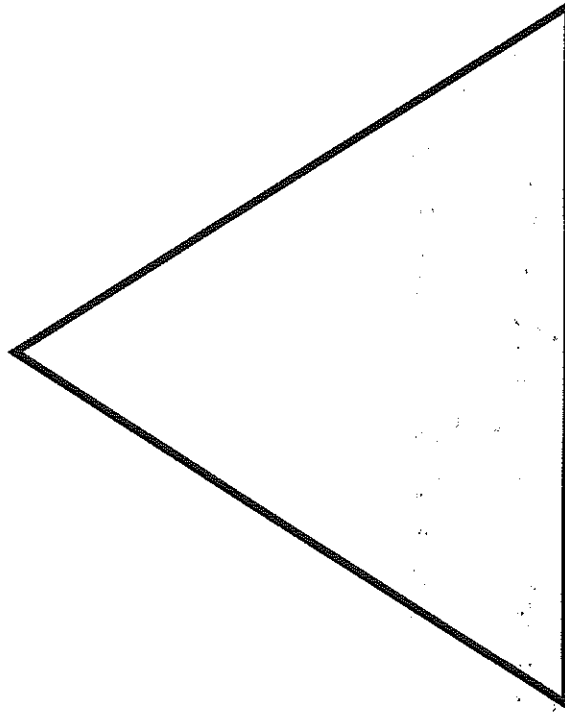
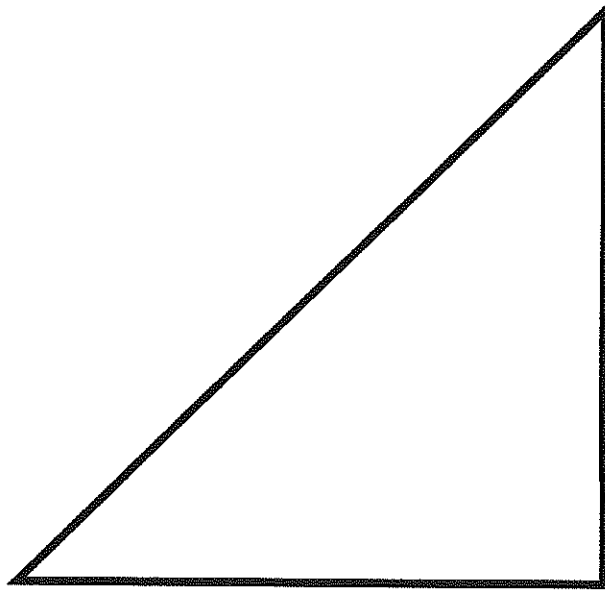


Pg (34)

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- 101) Draw the angle bisectors to all the three angles of the given triangles

Important: (The point of intersection of the angle bisectors of a triangle is called the **incenter**)



Pg (35)

102)

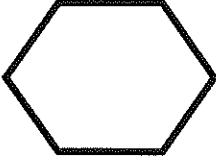
Draw the following (Hint: Always draw a rough figure first)

a) $\triangle PQR$ such that $\overline{PQ} = 7\text{cm}$, $\overline{QR} = 4.9\text{cm}$, $\overline{PR} = 5.3\text{cm}$

b) $\triangle LMN$ such that $MN = 5\text{cm}$, $\angle M = 100^\circ$, $\angle N = 45^\circ$

Pg (36)

Challenge Math

1	Josh walks 3 miles to the east, then 4 miles to the south. If he then back to the point at which he started, what is the total length he walked in miles? (Hint : Use Pythagoras Theorem)	<input type="text"/>
2	Evaluate: $2^5 + 2^5 + 2^5 + 2^5$	<input type="text"/>
3	What is the sum of the first ten prime numbers?	<input type="text"/>
4	How many diagonals are there in a hexagon? 	<input type="text"/>
5	How many diagonals are there in a decagon?	<input type="text"/>
6	A photograph that is 8 inches by 10 inches is enlarged by 2 inches on each dimension. What is the percent increase in the area?	<input type="text"/>

Challenge Math

1	A photograph that is 5 inches by 9 inches is enlarged by one inch on each dimension. Estimate what is the percent increase in the area? <input data-bbox="1096 443 1466 512" type="text"/>
2	What is the value of x if the three sides of a triangle are x cm , $2x$ cm and $2x+3$ cm. The perimeter of the triangle is 48 cm <input data-bbox="1101 667 1466 737" type="text"/>
3	A trapezoid has two bases, one of which is 3 times as long as the other. If the height of the trapezoid is 5 and the longer base is 9, what is the area of the trapezoid? <input data-bbox="1089 938 1455 1008" type="text"/>
4	find the value of { square root of (13 squared – 12 squared) } <input data-bbox="1089 1211 1455 1281" type="text"/>
5	Two complementary angles have a ratio of 5:1. What is the measure of the larger angle, in degrees? <input data-bbox="1089 1484 1455 1554" type="text"/>
6	A piece of string 180 feet long is cut into 2 pieces. If the ratio of the lengths is 1:5, how long is the shorter piece of rope, in feet? <input data-bbox="1089 1751 1455 1820" type="text"/>

Product of binomials: (can be solved horizontally or vertically) C2

	vertically	horizontally
a)	$(a+b)(a+b)$ <input type="text"/>	$(a+b)(a+b)$ <input type="text"/>
b)	$(a-b)(a-b)$ <input type="text"/>	$(a-b)(a-b)$ <input type="text"/>
c)	$(a+b)(a-b)$ <input type="text"/>	$(a+b)(a-b)$ <input type="text"/>

Product of binomials: (can be solved horizontally or vertically) $C2$

	vertically	horizontally
a)	$(2x+3)(x+1)$ <input type="text"/>	$(2x+3)(x+1)$ <input type="text"/>
b)	$(2x+3)(x-1)$ <input type="text"/>	$(2x+3)(x-1)$ <input type="text"/>
c)	$(2x-3)(x-1)$ <input type="text"/>	$(2x-3)(x-1)$ <input type="text"/>