Review 1: Numerical Skills

1. Evaluate.

a) $\frac{1}{3}-\frac{5}{6}-1\frac{1}{3}$ b) $\frac{3}{2}-\left(\frac{3}{4}+\frac{1}{4}\right)$ c) $\frac{-4}{5}\left(\frac{-3}{4}+\frac{1}{3}\right)$ d) $\left(1\frac{4}{5}+\frac{3}{4}\right)\left(-\frac{1}{3}+\frac{-1}{4}\right)$

e) $\frac{-5}{7}\times\frac{28}{5}\div\left(-\frac{8}{6}\right)$ f) $3\frac{1}{2}+\frac{8}{15}\div\frac{4}{45}$ g) $\sqrt{3^2}+4^3+12^2$ h) $\frac{5\sqrt{16}-8}{3}$

2. Which of the following number are rational numbers?

a) $0.\overline{7}$ b) 3.14 c) $1\frac{3}{4}$ d) 0.6 e) $\sqrt{5}$

3. Write in fractional form in lowest terms.

a) 0.62 b) 1.4 c) -7.25

4. Write in decimal form.

a) $-\frac{22}{3}$ b) $\frac{13}{7}$ c) $-4\frac{7}{8}$ d) 5.0×10^5 e) 2.85×10^{-4}

5. Write in scientific notation.

a) 37300 000 b) 0.000 000 000 015 4 c) 200 000 000 000 $\times$ 0.000 000 0007

6. Simplify.

a) $a\cdot a^3$ b) $(2a^2)(3a)$ c) $b^7\div b^3$ d) $10x^{10}\div 20x^5$ e) $3a^0$

7. Evaluate.

a) $2^{-1}+3^2$ b) $\left(\frac{-4}{3}\right)^{-1}$ c) $\left(\frac{2}{3}\right)^{-3}$ d) $\left(\frac{3}{4}\right)^{0}$ e) $2^2\times3^{-2}$

f) $\frac{5}{2^{-3}}$ g) $\frac{3^6\times3^7}{3^{10}}$

8. Simplify and then evaluate for the given value(s).

a) $(x^{-5})^2(x^7)^3(x^2)^{-6}$ when $x=2$

b) $\frac{(m^5)^2}{m^{11}}+\frac{(n^2)^3}{n^7}$ when $m=3$ and $n=4$

9. Graph $y=3^x$ and $y=\left(\frac{1}{3}\right)^x$ on the same axes.

Use this table of values for each relation.

x	y
-3	
-2	
-1	
0	
1	
2	
3	

Review 2: Algebraic Skills

1. Simplify.

a) $4xy - 12y^2 + 7xy + 9y^2$ b) $2a^2 - 4a - (3a^2 - 7a)$ c) $xy + x^2y - 4xy + 3yx^2$

d) $5y^3(2y^4 + 3y^2 + 1)$ e) $k(5-k) - 3(2k - k^2)$ f) $2t(t+3) + 4t(t-2)$

g) $2x(3x+5y) - 2(x^2 + 3xy) - 5y(3x^2 - 2x)$ h) $3x(2x+y) - 2x[3 - (2x+4)]$

2. Simplify.

a) $(5a^3b^2c)(2ab^3)$ b) $(30x^{10}y^6z) \div (15x^2y^{-3})$ c) $\left(\dfrac{16x^5y^3}{4x^2y^2}\right)^3$

d) $\dfrac{4xy - 8}{4}$ e) $\dfrac{15x^2y^3 - 20x^5y^2 + 25x^3y^4}{5xy^2}$

3. Factor completely.

a) $3a^2 - 9a + 6ab$ b) $3x^2y - 6xy^3$ c) $-x^2 - 10x$

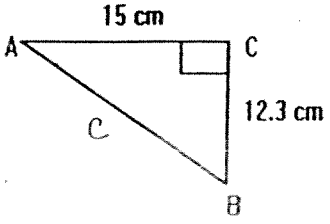
4. Solve the following equations. Show a formal check for a) and b).

a) $2x - 8 = 3x + 2$ b) $6(2-x) = 3(x+2)$ c) $\dfrac{x+3}{7} = -2$

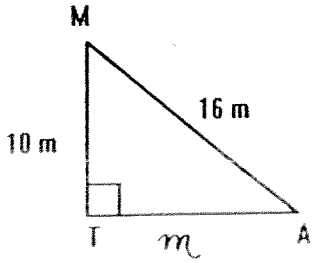
d) $\dfrac{3x+3}{5} = \dfrac{x}{2}$ e) $\dfrac{y+4}{3} = \dfrac{y+1}{2}$ f) $\dfrac{x-1}{2} + \dfrac{3x+2}{2} = \dfrac{5}{3}$

5. Solve for the indicated side. Round answers to one decimal place.

a)



b)



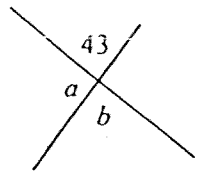
6. Marsha leans a 6.0 m ladder against a wall. The base of the ladder is 1.5 m from the wall. How far up the wall will the ladder reach?

7. On his way to school, Abdul cuts across a vacant lot that measures 110 m by 55 m. He walks diagonally from corner to corner. One day, a fence is built around the lot and he has to walk around. How much farther does he have to walk?

Review 3: Angles, Triangles and Parallel Lines

Determine the value of each variable.

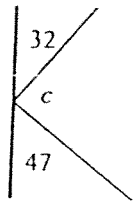
1.



$a =$

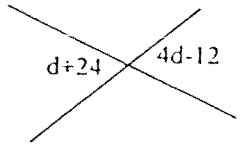
$b =$

2.



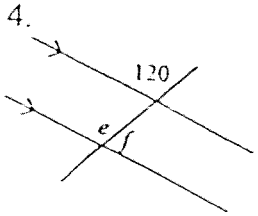
$c =$

3.



$d =$

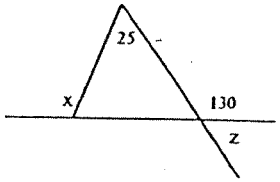
4.



$e =$

$f =$

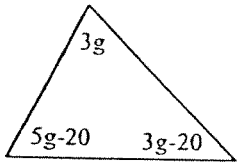
5.



$x =$

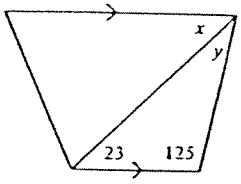
$z =$

6.



$g =$

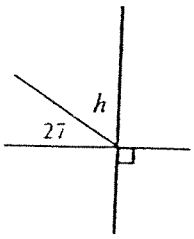
7.



$x =$

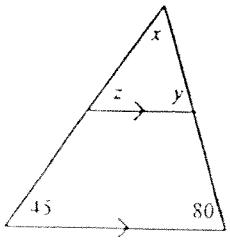
$y =$

8.



$h =$

9.

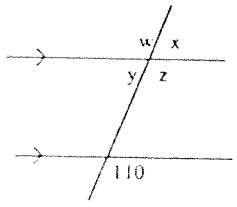


$x =$

$y =$

$z =$

10.



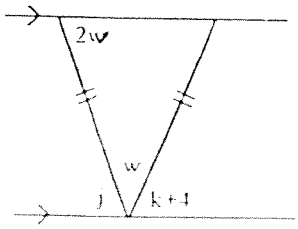
$w =$

$y =$

$x =$

$z =$

11.



$j =$

$k =$

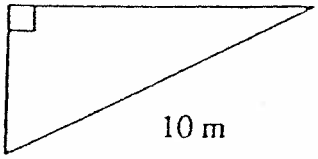
$w =$

Review 4: Perimeter, Area and Volume

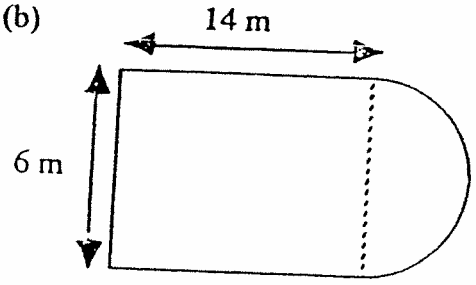
Use your formula sheet for this review.
Use $\pi \cong 3.14$. Round your answers to 1 decimal place.

1. For each of the following diagrams, find the **perimeter** and the **area**.

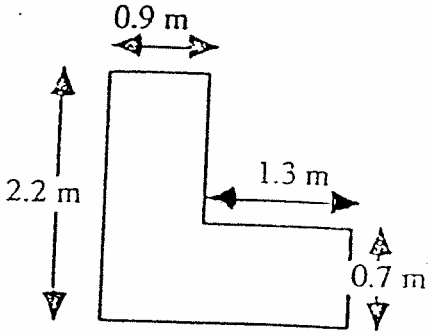
(a)



(b)

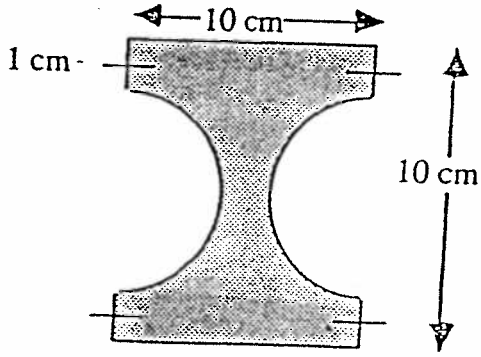


(c)

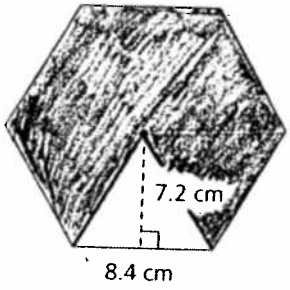


2. Calculate the **area** of the shaded region.

a)

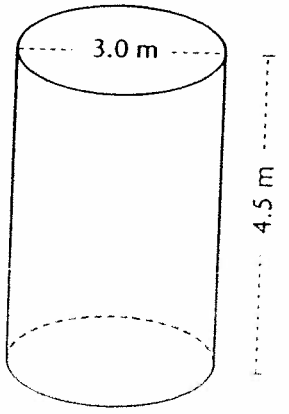


b)

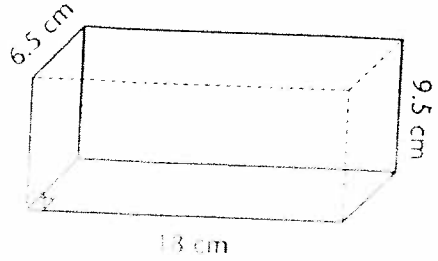


3. For each of the following, calculate the **total surface area** and the **volume**.

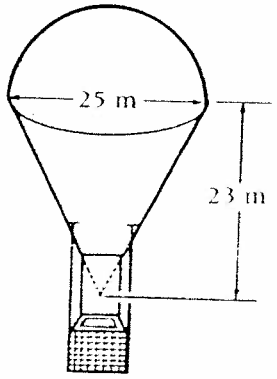
a)



b)



4. Find the **volume** of helium needed to fill the hot-air balloon.



Review 5: Analytic Geometry

1. Complete in your notebook:

   a) When data plotted on a grid rises to the left, this is described as _____ correlation.

   b) In which quadrant are x-coordinates negative and y-coordinates positive? _____

   c) The point (8,0) is on the ___-axis. The coordinates of the origin are _____.

   d) The slope of all vertical lines is _____. The slope of all horizontal lines is _____.

   e) Lines that rise to the right have _____ slopes.

   f) In the line $y = -3x + 7$, the slope is _____ and the y-intercept is _____.

   g) Find the equation of the line with slope $\frac{2}{3}$ and y-intercept 6 (in standard form). _____

   h) The rise can be found by calculating the difference in the ____-coordinates.

   i) A vertical line has a run of _____.

   j) A relation of the form $y = mx$ shows _____ variation while a relation of the form $y = mx + b$ shows _____ variation.

   k) For a house call, a plumber charges according to the relation $C = 35t + 40$ where C is the charge in dollars and t is time in hours. The fixed charge is _____ and the hourly rate is _____.

   l) The slope of any line parallel to $y = -7x + 2$ is _____. The slope of any line perpendicular to $y = -7x + 2$ is _____.

2. Graph the following lines on separate sets of axes using the stated method.

   a) $y = 5x - 2$ (table of values)

   b) $y = -\frac{5}{4}x + 3$ (slope, y-intercept method)

   c) $4x - 3y + 12 = 0$ (x- and y- intercept method)

   d) $5x - 7y = 0$ (method of your choice)

3. Graph on the same set of axes.

   a) $x = 5$ b) $y = 0$ c) $y + 8 = 0$ d) $5x - 30 = 0$

4. Change to standard form.

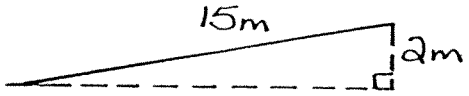
a) $y = 5x + 2$ b) $y = -\frac{1}{2}x$ c) $y = \frac{3}{5}x - 8$ d) $y = 10$

5. Change to slope, y-intercept form. State the slope and y-intercept.

a) $2x - 3y + 15 = 0$ b) $y - 15 = 0$ c) $15x + 25y - 30 = 0$

6. By means of graphing, find the intersection point of the lines $y = 2x - 2$ and $3x + y = 13$.

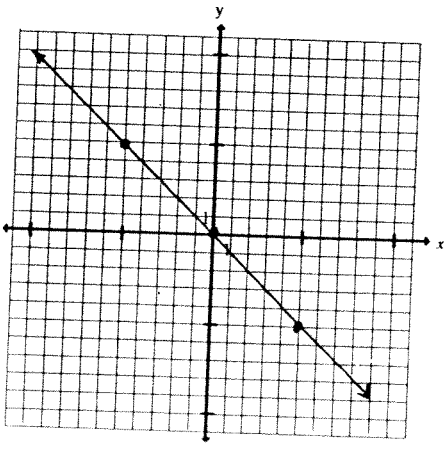
7. Find the slope of the wheelchair ramp:



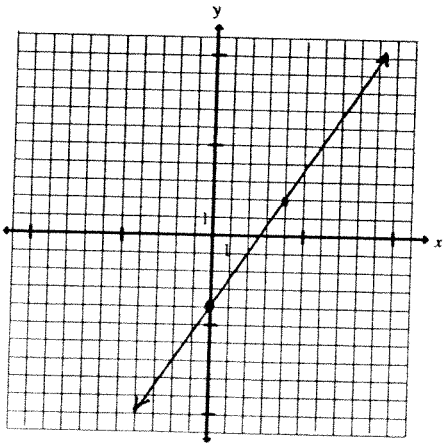
8. By formula, find the slope of the line through each set of points:
a) (1,3) and (5,2) b) (-2,7) and (-5,-1) c) (4,5) and (-6,5) d) (-2,6) and (-2,-6)

9. State the equation of each line in the form $y = mx + b$.

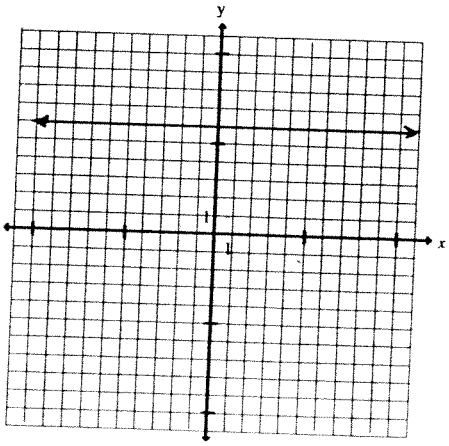
a)



b)



c)



10. Find the equation of each line in the form $y = mx + b$.

a) with slope 5 and y-intercept -10

b) with y-intercept 6 and perpendicular to the line $y = \frac{2}{5}x - 10$

c) through the point (0,-2) and parallel to the line $y = -4x + 7$

d) with slope $\frac{1}{3}$ and passing through (6,-2)

e) passing through points (-2,4) and (5,-3)

f) perpendicular to $y = -\frac{1}{2}x + 6$ with the same y-intercept as the line $y = 3x - 2$

11. A house is expected to increase in value according to the relation $y = 6500x + 150\,000$ where y is the value of the house after x years.
    a) Find the slope of the line and interpret its meaning.
    b) Find the y-intercept and interpret its meaning.
    c) Find the value of the house after 12 years.

12. Jeff's family is driving home from a camping trip. They are using cruise control so their speed is a constant. After 1 hour, they are 250 km from home. After 3 hours, they are 50 km from home.

    a) What is the independent variable? The dependent variable?
    b) Represent the given information as two ordered pairs.
    c) Write an equation for the relation in the form $y = mx + b$.
    d) Interpret the meaning of the slope and y-intercept in this situation.

Answers

Review 1: Numerical Skills

1. a) $-\frac{11}{6}$ b) $\frac{1}{2}$ c) $\frac{1}{3}$ d) $-\frac{119}{80}$ e) 3 f) $9\frac{1}{2}$ g) 211 h) 4
2. a, b, c, d
3. a) $\frac{31}{50}$ b) $\frac{7}{5}$ c) $-\frac{29}{4}$
4. $-7.\overline{3}$ b) $1.\overline{857142}$ c) -4.875 d) 500000 e) 0.000285
5. a) 3.73×10^{7} b) 1.54×10^{-12} c) 1.4×10^{2}
6. a) a^4 b) $6a^3$ c) b^4 d) $\frac{1}{2}x^5$ e) 3
7. a) $9\frac{1}{2}$ b) $-\frac{3}{4}$ c) $\frac{27}{8}$ d) 1 e) $\frac{4}{9}$ f) 40 g) 27
8. a) $\frac{1}{2}$ b) $\frac{7}{12}$

Review 2: Algebraic Skills

1. a) $11xy-3y^2$ b) $-a^2+3a$ c) $-3xy+4x^2y$ d) $10y^7+15y^5+5y^3$ e) $2k^2-k$
   f) $6t^2-2t$ g) $4x^2+14xy-15x^2y$ h) $10x^2+3xy+2x$
2. a) $10a^4b^5c$ b) $2x^8y^9z$ c) $64x^9y^3$ d) $xy-2$ e) $3xy-4x^4+5x^2y^2$
3. a) $3a(a-3+2b)$ b) $3xy(x-2y^2)$ c) $-x(x+10)$
4. a) -10 b) $\frac{2}{3}$ c) -17 d) -6 e) 5 f) $\frac{7}{12}$
5. a) $19.4\,cm$ b) $12.5\,m$
6. $5.8\,m$
7. $42\,m$

Review 3: Angles, Triangles and Parallel Lines

1. a = 137°, b = 43°
2. c = 101°
3. d = 12°
4. e = 120°, f = 60°
5. x = 75°, y = 50°
6. g = 20°
7. x = 23°, y = 32°
8. h = 63°
9. x = 55°, y = 80°, z = 45°
10. w = 110°, x = 70°, y = 70°, z = 110°
11. j = 72°, k = 68°, w = 36°

Review 4: Perimeter, Area and Volume

1. a) $P=24\,m$, $A=24\,m^2$ b) $P=43.4\,m$, $A=98.1\,m^2$ c) $P=8.8\,m$, $A\cong2.9\,m^2$
2. a) $A\cong49.8\,cm^2$ b) $A\cong151.2\,cm^2$
3. a) $SA\cong5652\,m^2$, $V\cong31.8\,m^3$ b) $SA\cong699.5\,cm^2$, $V\cong1111.5\,cm^3$
4. $V\cong7850\,m^3$

Review 5: Analytic Geometry

4. a) $5x - y + 2 = 0$ b) $x + 2y = 0$ c) $3x - 5y - 40 = 0$ d) $y - 10 = 0$

5. a) $y = \frac{2}{3}x + 5$ b) $y = 15$ c) $y = -\frac{3}{5}x + \frac{6}{5}$

6. Intersection point is (3,4)

7. Slope is approx. 0.13

8. a) $m = -\frac{1}{4}$ b) $m = \frac{8}{3}$ c) $m = 0$ d) m is undefined

9. a) $y = -x$ b) $y = \frac{3}{2}x - 4$ c) $y = 6$

10. a) $y = 5x - 10$ b) $y = -\frac{5}{2}x + 6$ c) $y = -4x - 2$ d) $y = \frac{1}{3}x - 4$ e) $y = -x + 2$
    f) $y = 2x - 2$

11. a) slope is 6500 b) y-intercept is 150 000 c) $228 000

12. a) distance is the dependent variable; time is the independent variable
    b) (1,250) (3,50)
    c) $y = -100x + 350$