EXAM REVIEW QUESTIONS: GRADE 9 ACADEMIC

1. Perform the following conversions:

a) $39\frac{3}{4}$ % to decimals

b) 54% to a fraction in lowest terms

c) 0.375 to a fraction in lowest terms

d) $\frac{8}{9}$ to a decimal

2. Evaluate.

a) $-5(-3+9)+4$

b) $-6(3\times-3)^2+(-4)$

c) $-9-(-3--5)^3+(-4)$

d) $-4(0-1+4)^3+-50$

e) $\frac{-6+(3--3^3)}{(-3^3+3^2)}$

3. Calculate each of the following:

a) 9% of 200

b) 37.5% of a number is 24. What is the number?

4. Simplify the following:

a) $\frac{7^4 \cdot 7^5}{7^{-3}}$

b) $(8 \cdot 8^{-4})^{-2}$

c) $2^{-3}+6^{-2}$

5. Jason writes $4^7 \div 4^3 = 4^{21}$. Explain the mathematical error in his answer. Use mathematical vocabulary.

6. The cost of having a plumber fix your toilet is given by the equation $C = 45+40h$ where C is the cost in dollars and h is the number of hours he spends fixing it.
a) What is the total cost of fixing the toilet if he spends 1 hour and 30 minutes working on the toilet?
b) How long did the plumber take to fix the toilet if he charges you $245?

7. The Sports Authority has a blowout sale on bicycles. Anton is excited because a brand-name bike was on sale for a 35% discount. It was regularly $453.75 and there is 11% sales tax.
a) What is the sale price of the bike? (Not including taxes.)
b) How much will Anton have to pay including taxes for the bike that is on sale?

8. If 5 apples cost $2.45 and each apple weighs 0.85 pounds,
a) How much does one apple cost?

b) How much would it cost for a $4\frac{1}{4}$ pound bag of apples, assuming each apple weighs the same?

9. Write each of the following in Scientific Notation:
a) 0.000875   b) 175000000

10. Write each in decimal/standard form:
a) 2.45×10^{-4} b) 7.3×10^7

11. Use scientific notation to evaluate each of the following and leave your final answer in scientific notation.

a) $(3.52\times10^7)(4.2\times10^{-3})$ b) $\frac{5.79\times10^6}{6.45\times10^3}$

12. Simplify and evaluate.

a) $\sqrt{121}+\sqrt{81}$ b) $\sqrt{64+36}$ c) $\sqrt{26+\sqrt{100}}$ d) $\sqrt{\sqrt{256}+\sqrt{400}}$

13. Consider the following expression: $6x^2-51$
a) What is the coefficient?

b) What is the constant term?

14. Expand and simplify (if possible).

a) $7abc(a + 4b - c)$

b) $7x(5x + 2) - 3(x^2 - x + 7)$

15. Label the answers in the questions above as monomials, binomials, trinomials, or polynomials.

16. Evaluate for $a = 2, b = -3, c = \dfrac{3}{4}, d = -\dfrac{4}{5}$

a) $ab + c$

b) $cd - c$

17. Solve:

a) $x - 3 = 19$

b) $60 = 2y + 30$

c) $6n + 3 + 4n - 8n = -7$

d) $4m - 3 + 2m = 19 + 5m - 2$

e) $43 - 25b + 11 = 7b + 31 + 8b$

f) $5u - (4u + 3) = 7$

g) $4(y + 2) = 3(2y - 5)$

h) $5(d - 7) + 2 = 4(d - 6) + 3d$

i) $2m + 9(m + 1) = 3(5m - 2) - 5(m - 4)$

18. Solve:

a) $\dfrac{2r}{3} = 4$

b) $\dfrac{m-1}{2} = \dfrac{m+4}{3}$

c) $\dfrac{7}{x} + \dfrac{4}{3} = \dfrac{7}{5} - \dfrac{5}{3x}$

19. Determine the equation of the line:

a) having slope $\dfrac{1}{2}$ and y-intercept 7

b) Passing through the point (7,2) and having slope -4

c) That passes through the points (-2,3) and (5,-7)

d) That is parallel to the line $3y = 9x - 4$ and passes through the point (7,2)

e) That is perpendicular to the line $6y = -4 + 7x$ and that passes through the point (-7, 5)

20. Graph the following lines without a table of values.

a) $y = \dfrac{-1}{2}x + 4$

b) $3y = 12x - 9$

c) $y = \dfrac{4}{5}x - 2$

21. Find the x and y intercepts for each of the following equations.

a) $x - y + 3 = 0$

b) $3x + 7y - 21 = 0$

22. Graph the following using a table of values.

a) $y = 3x - 4$

b) $y = 1 - 3x^2$

23. Are each of the following lines parallel, perpendicular or neither? Show calculations/proof to support your answer.

a) $\begin{array}{l} y = 3x + 5 \\ y = -5 + 3x \end{array}$

b) $\begin{array}{l} y = 4x - 7 \\ y = \dfrac{-1}{4}x - 7 \end{array}$

c) $\begin{array}{l} y = 7x + 5 \\ y = 5 + 7x \end{array}$

24. Find the slope between each pair of points. Do not graph.

a) A(1,1) and B(3, 0)

b) C(7,-2) and D(-3, 5)

25. Given $5y = 7x + 10$:

a) What is the slope of a line that is parallel to the line given?

b) What is the slope of a line perpendicular to the given line?

26. What does it mean to "solve a linear system"?

27. Solve the system by graphing:

a)
$$y = -x + 5$$
$$y = -3x + 3$$

b)
$$y = 3x + 11$$
$$y = \frac{1}{2}x + 3$$

28. Solve the system by any method:

a)
$$x + y = -8$$
$$x - 2y = 7$$

b)
$$x + 2y = 6$$
$$2x - 3y = 5$$

29. Does the point (3, 5) satisfy or lie on the line $3x = 5y - 17\,3$? Show calculations to support your answer. Do not graph.

30. The co-ordinates of the vertices of a quadrilateral are T(-4, -4), R(3, -2), A(4, -4) and P(-2, -6). Draw the quadrilateral on a grid. Using slope, determine what type of quadrilateral it is. Explain.

31. Graph the points A(-3, 8), B(-1, 2) and C(3, 4). Draw line segments to form a triangle. Determine if it is a right triangle. Show all your work.

32. Answer the following questions for each of the following tables:
a) Calculate the first differences.
b) Does the table represent a linear or non-linear relationship. Explain.
c) If linear, what is the slope of the relation?

i)

x	y
0	-4
2	-2
4	0

ii)

x	y
2	5
3	8
4	11

iii)

x	y
4	10
3	8
-5	6

33. The perimeter of a triangle is 28m. The longest side is three more than twice the shortest side while the middle side is the shortest side increased by five. Find the length of each side.

34. One number is five times another number. The sum of the numbers is 36. What are the numbers?

35. The sum of two numbers is 51. Twice the first number plus four times the second number is 128. What are the numbers?
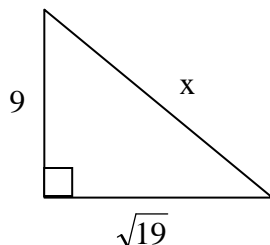
36. The ages of Catherine and Anna total 50 years. Catherine's age less twice Anna's age is 8. Find Catherine and Anna's ages.
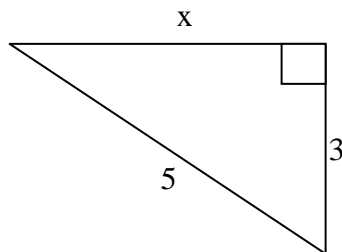
37. Factor fully and check by expanding.
a) $-3a + 12a^4$ b) $8y^3 - 4y^2 + 2y$ c) $12k^2 - 48k^4 - 18k^6$ d) $25a^5b^3 + 35a^3b^4 - 20a^4b^5$

38. Find x in each of the following. If needed, round your answer to two decimal places.
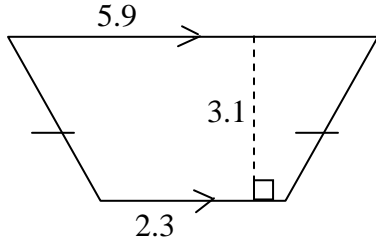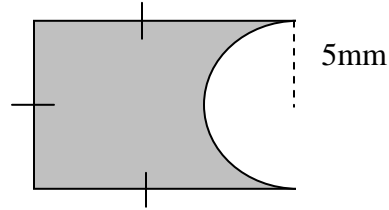a)   b)

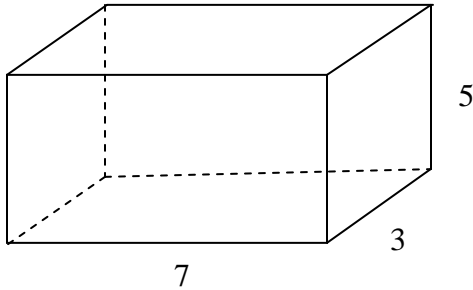39. Calculate the area of each of the following.

a)

5.9

3.1

2.3

b)

5mm

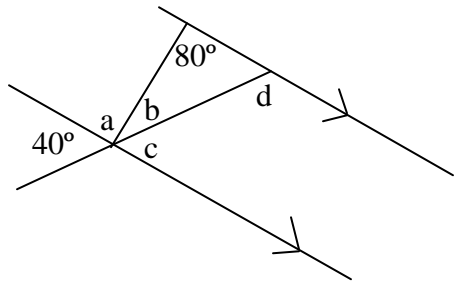40. Calculate the surface are and volume of the following.
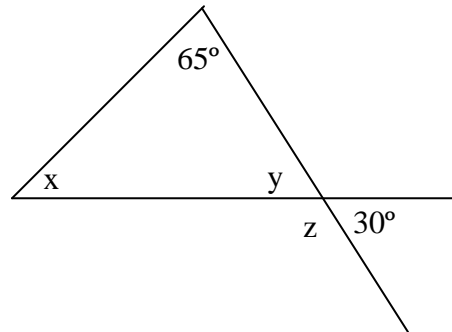
5

3

7

41. Find the surface area and volume of
a) a sphere with diameter 12cm
b) a cylinder with height 10mm and radium 4mm
c) a cone with slant height 5m, height 4m, and diameter 6m

42. Calculate the missing measures and state reasons for your answers.

a)

80°

d

a b
c

40°

b)

65°

x   y

z   30°

43. Define the following:
a) rational number   b) irrational number   c) integer   d) whole number

44. A regular shape has 10 equal sides.
a) What is the measure of one interior angle?
b) What is the measure of one exterior angle?

45. Jim runs a company that makes ball bearings. The bearings are shipped in boxes that are then loaded onto trucks. Each bearing has a diameter of 0.96cm.
a) Each box can hold 8000cm3 of ball bearings. How many ball bearings can a box hold?
b) Is there any wasted space inside a filled box? If so, how much?
c) The maximum mass a truck can carry is 11000kg. What is the maximum number of boxes that can be loaded into a truck?

46. What is a line of best fit? What is it used for?

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