Academic

Grade 9 Assessment of Mathematics

Winter 2007

SAMPLE ASSESSMENT QUESTIONS

Education Quality and Accountability Office

EQAO

Please note: The format of these booklets is slightly different from that used for the assessment. The items themselves remain the same.

1 Meg has been asked to determine the value of the numerical expression below.

$$\frac{2^{400}}{2^{396}} - 2^3$$

Which of the following is the value of Meg's expression?

A 1

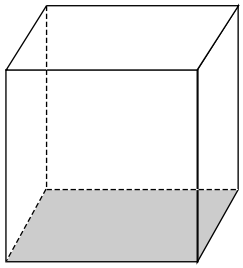
B 2

C 4

D 8

2 Expressions for the base area and volume of a prism are given below.

Volume = $64a^3b^6$



Base area = $16ab^3$

Which expression represents the height of the prism?

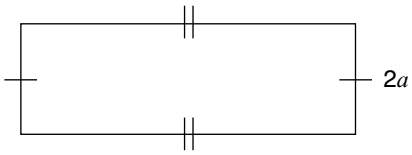
F $4a^2b^3$

G $4a^3b^3$

H $1024a^3b^9$

J $1024a^4b^9$

3 A rectangular field has a **perimeter** of $(10a - 6)$ metres and a width of $2a$ metres.



Which expression represents the **length** of this field?

A $8a - 6$

B $12a - 6$

C $3a - 3$

D $3a^2 - 3$

4 Which value of x satisfies the equation $5 - 2x = 9$?

F $x = -7$

G $x = -2$

H $x = 2$

J $x = 3$

5 Sales Goals

Alexis works part-time at a clothing store. She is paid an hourly rate of $10.25/h and also earns a commission of 3.5% of her total weekly sales.

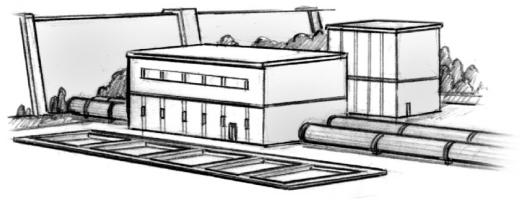
Alexis works at the store 12 hours a week.

If Alexis's goal is to earn $150 every week, what do her total weekly sales need to be?

Show your work.

6 The charges on a monthly water bill are \$0.86 per m^3 of water used plus a service charge of \$4.49.

Let C = total charge, in dollars, and
w = total amount of water used, in m^3.



Which equation represents the relationship between C and w?

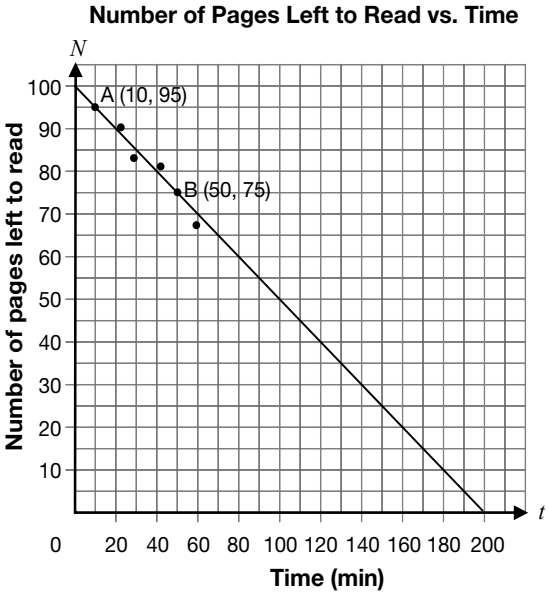
F $C = 4.49 \times 0.86w$

G $C = 4.49w + 0.86$

H $C = 4.49 + 0.86w$

J $C = (4.49 + 0.86)w$

7 The following scatter plot shows the relationship between N, the number of pages in Annie's textbook that she has left to read, and t, the time in minutes she spends reading the book.



Which equation represents the line above?

A $N = -\frac{1}{2}t + 100$

B $N = -\frac{1}{2}t + 200$

C $N = -t + 100$

D $N = -t + 200$

8 Temira needs to rent a car. She considers the following price equations, where C is the total cost, in dollars, and n is the number of days.

Company	Equation
Rentway	$C = 20n + 100$
Cheapie's Rentals	$C = 25n + 50$
Cars Cars Cars	$C = 50n$
Drive Away	$C = 15n + 125$

Which company should she choose if she is planning to rent the car for at least 10 days?

F Rentway

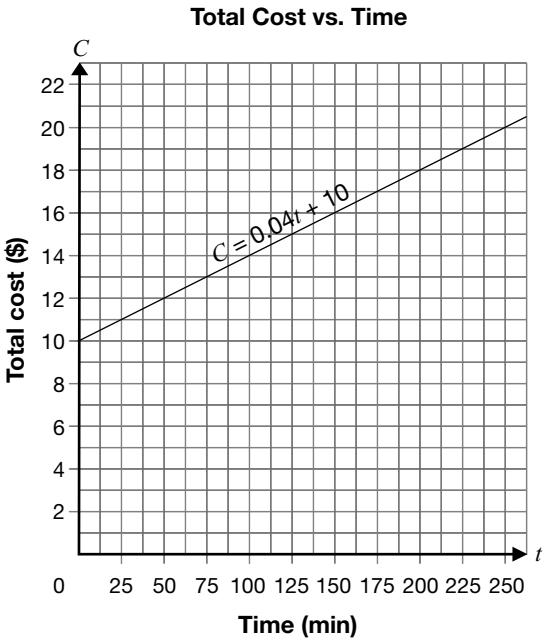
G Cheapie's Rentals

H Cars Cars Cars

J Drive Away

9 Two Internet service providers are competing.

The equation $\boldsymbol{C = 0.04t + 10}$ represents the relationship between the total cost, C, charged by Internet Connections and the time, t.



Surf Away wants **always** to be cheaper than Internet Connections.

Which of the following equations represents this situation?

A $C = 15$

B $C = 0.02t + 11$

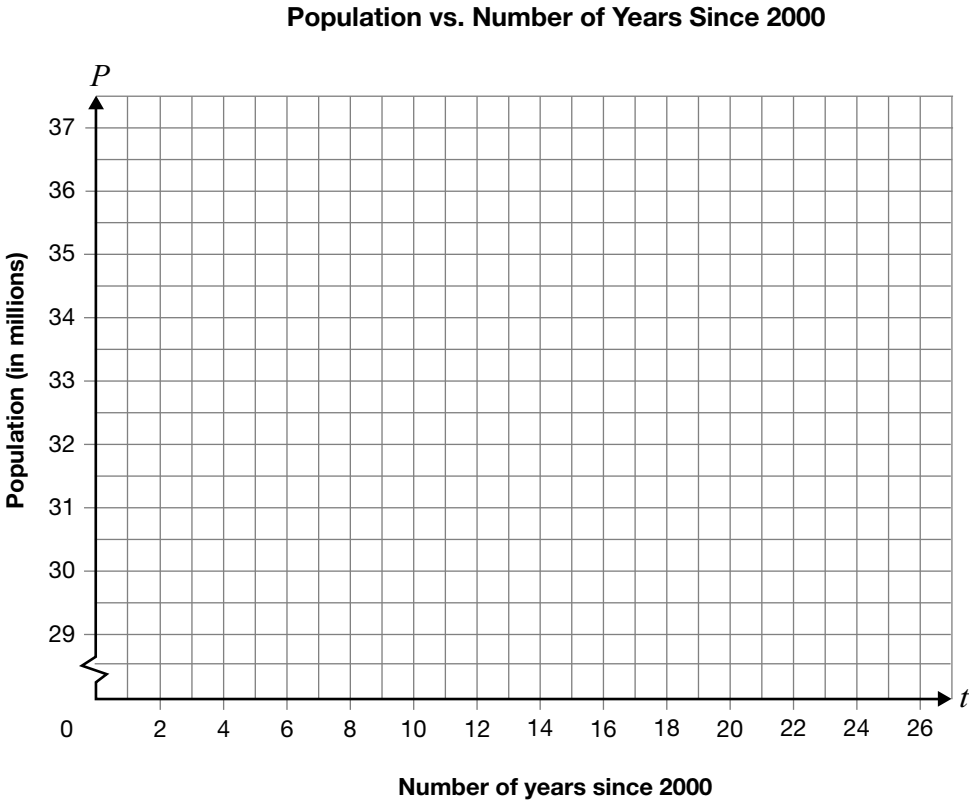
C $C = 0.03t + 9$

D $C = 0.05t + 8$

10 Population Plans

Alvin is researching the population of Canada. He finds data for the year 2001 and predictions for every 5 years after that, as shown below.

Number of years since 2000, *t*	Population (in millions), *P*
1	31.1
6	32.2
11	33.4
16	34.4
21	35.4
26	36.2



Determine an algebraic model for Alvin's data, and use it to make a reasonable prediction for the population of Canada in 2036.

Justify your answer.

11 Which of the following equations is **not** represented by a straight line on a graph?

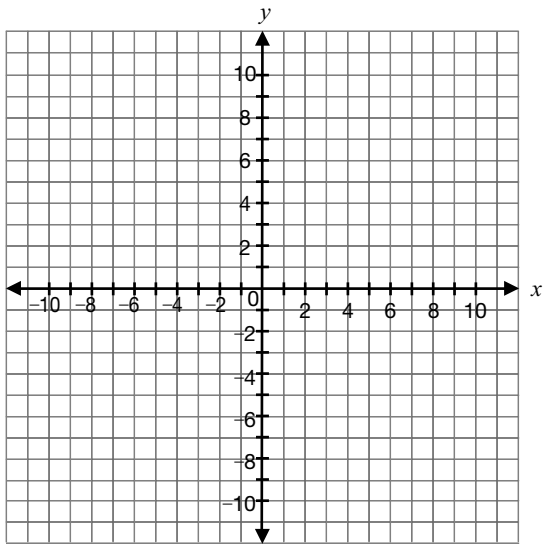
A $x = 3y - 4$

B $y = -2x$

C $x = 4$

D $y = 2x^2 - 2$

12 Imagine the graph for the relation $4x - 5y + 20 = 0$.



What is the **slope**?

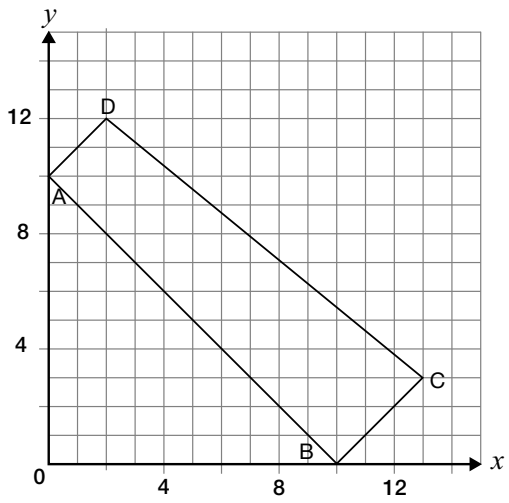
F $\frac{4}{5}$

G $-\frac{4}{5}$

H $\frac{5}{4}$

J 4

13 The following graph shows the quadrilateral ABCD.



Which of the following statements is **false**?

A AD is parallel to BC.

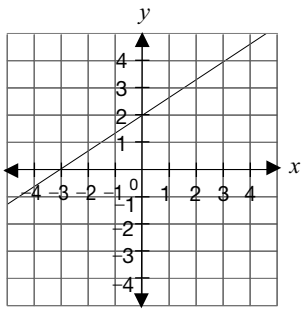
B DC is parallel to AB.

C CB is perpendicular to AB.

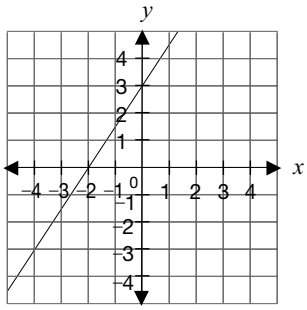
D DA is perpendicular to AB.

14 Which **graph** represents the relation $y = \frac{2}{3}x + 2$?

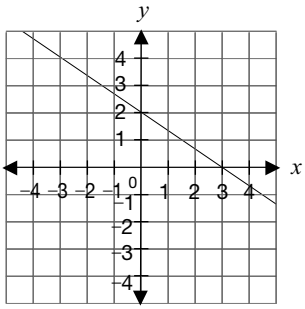
F



G



H



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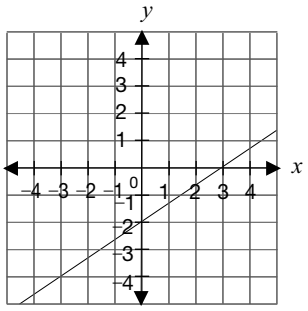


15 A line has the following characteristics.

- It is perpendicular to the line $y = \frac{1}{2}x + 3$.
- It passes through the point (4, 0).

What are m, the slope, and b, the y-intercept, of the line?

A $m = \frac{1}{2}$; $b = 0$

B $m = \frac{1}{2}$; $b = 3$

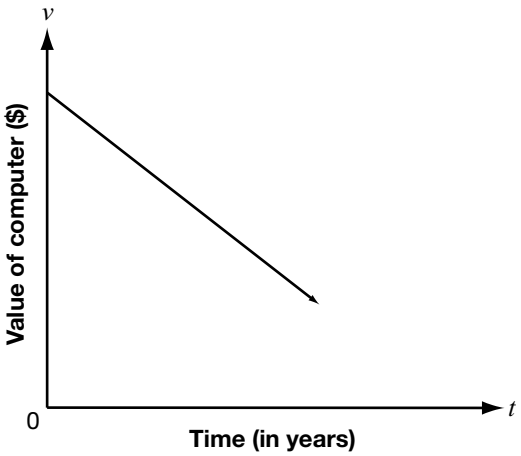
C $m = -2$; $b = 0$

D $m = -2$; $b = 8$

16 A computer decreases in value over time. The relationship between the value of the computer, v, in dollars after t years is written as the equation

$$v = -300t + 2100.$$

A line representing the relationship is graphed.



What does the v-intercept of the line represent?

F The decrease in value per year

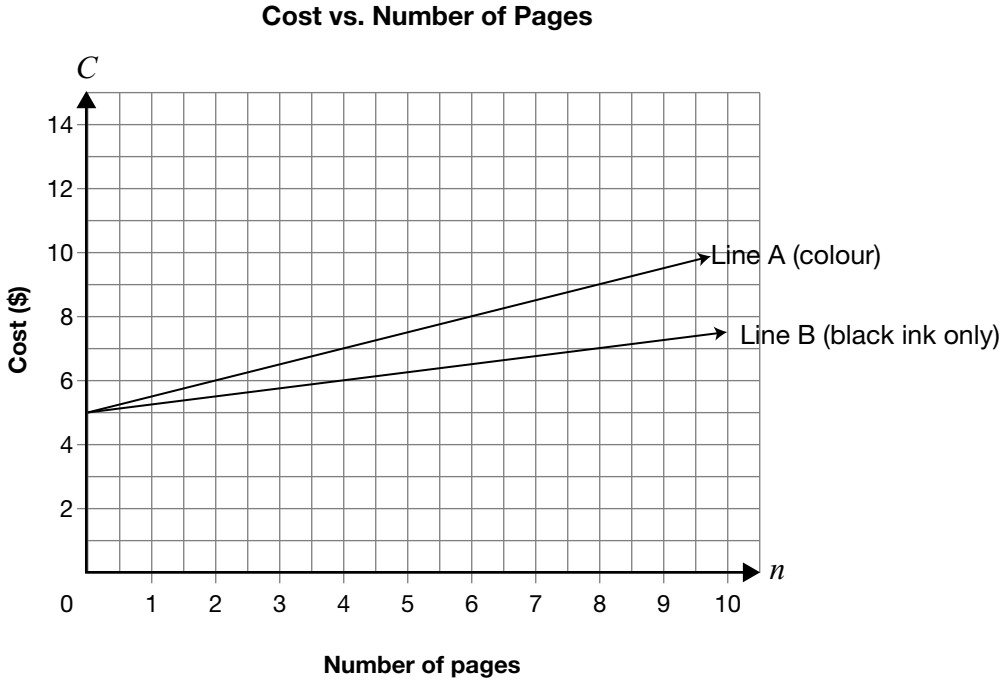
G The initial value of the computer

H The number of years until the value is $0

J The number of years the computer will work

17 To Colour or Not to Colour

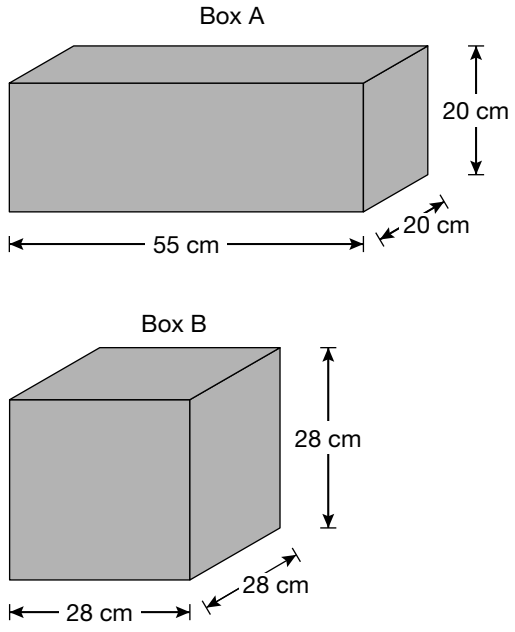
The graph below shows the cost to print a document at the Graphics Shop. Line A represents the cost of printing the document in colour. Line B represents the cost to print it with black ink only.



For a 500-page document, how much more will it cost to print in colour than with black ink only?

Show your work.

18 Box A and Box B have about the same volume. The cost to make a box depends on the amount of cardboard used.



Which of the following statements is correct?

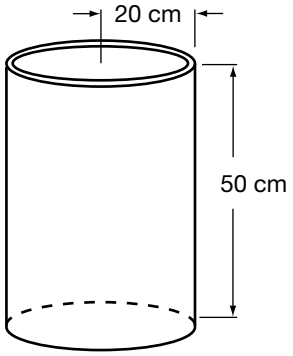
F Box B costs less; it uses 48 cm^3 less cardboard to make.

G Box A costs less; it uses 290 cm^3 less cardboard to make.

H Box B costs less; it uses 496 cm^2 less cardboard to make.

J Box A costs less; it uses 496 cm^2 less cardboard to make.

19 Brad has a cylindrical metal container that is open at the top. He wants to paint the outer surfaces of the container, including the bottom.



Which expression should he use to calculate the area to be painted?

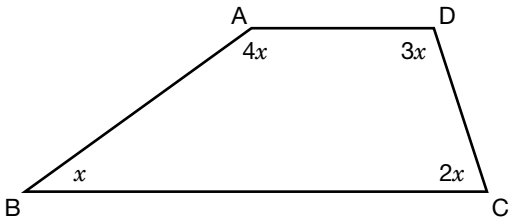
A $\pi(20)(50)$ cm^2

B $2\pi(20)(50)$ cm^2

C $2(\pi(20)^2 + \pi(20)(50))$ cm^2

D $(\pi(20)^2 + 2\pi(20)(50))$ cm^2

20 ABCD is a quadrilateral.



What is the measure of $\angle BAD$?

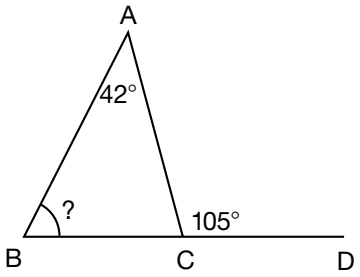
F 108°

G 120°

H 132°

J 144°

21 In the figure, BC is extended to D. $\angle BAC = 42°$ and $\angle ACD = 105°$.



What is the value of $\angle ABC$?

A 33°

B 42°

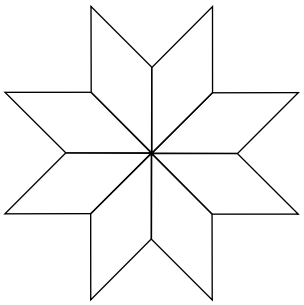
C 52°

D 63°

22 Geometric Quilts

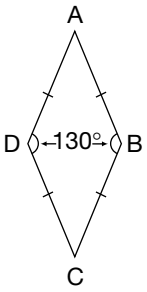
Paul's grandmother wants to use quilt pieces to make an **eight-pointed star** like the one shown.

Eight-Pointed Star



Her quilt pieces are in the shape of a rhombus with two angles of 130°.

Quilt Piece



Is it possible to make an **eight-pointed star** using copies of her quilt piece?

Justify your answer.

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