

# Academic



## Grade 9 Assessment of Mathematics Multiple-Choice Items

Spring 2005

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



Education  
Quality and  
Accountability  
Office

1. The average temperature during **10 days** in March is given by the expression

$$\frac{6(-2) - 5 + 3(-1)}{10}$$

What is the value of the expression?

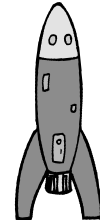
- a 2
  - b 1
  - c -1
  - d -2
2. Simplify the following expression:

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

- a  $6x^2 - 5x + 3$
- b  $6x^2 - 6x$
- c  $15x^2 - 5x$
- d  $6x^2 + 4x$

3. While experimenting with a toy rocket, Dan determines that he can model the rocket's height,  $h$ , in metres, with respect to time,  $t$ , in seconds, using the equation

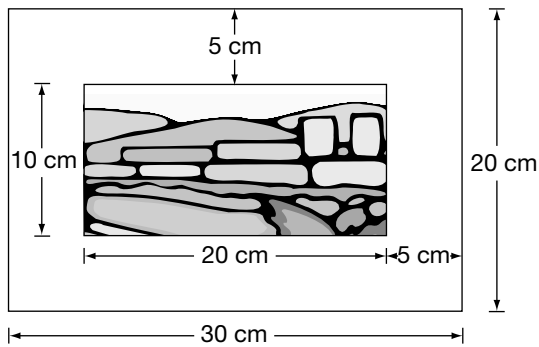
$$h = \frac{1}{2}t^2$$



Which calculation correctly finds the value of  $h$  when  $t = 10$ ?

- a  $h = \frac{1}{2} \times 10^2$   
 $= 5^2$   
 $= 25$
- b  $h = \frac{1}{2} \times 10^2$   
 $= \frac{1}{2} \times 20$   
 $= 10$
- c  $h = \frac{1}{2} \times 10^2$   
 $= \frac{1}{2} \times 100$   
 $= 50$
- d  $h = \frac{1}{2} \times 10^2$   
 $= \frac{1}{4} \times 100$   
 $= 25$

4. A frame around a photograph is 5 cm wide.



What **percentage** of the entire area is the frame?

- a 25%
- b 33%
- c 50%
- d 67%

5. In a soccer league, a win counts for 2 points, a tie counts for 1 point and a loss counts for 0 points. A soccer team has 5 wins, 2 ties and 3 losses.



If the team continues to win, tie and lose in the same ratio, which of the following values is the best prediction of their point total after 40 games?

- a 36 points
- b 48 points
- c 96 points
- d 480 points

6. The advertisement below shows the sale price of a big-digit calculator.

Sale Price  
**\$7.99**  
Save 50%

Big-digit  
calculator

12345678

What is the best estimate of the **regular price** of the big-digit calculator?

- a \$12
- b \$14
- c \$16
- d \$18

7. Juan would like to order some stationery items from a catalogue. He can spend up to \$15.00 but not more.

**Guaranteed Low Prices!**

\$3.13/item  1" Binder	\$2.39/item  Glue Stick	\$4.28/item  Mechanical Pencil
\$1.96/item  Notebook	\$6.49/item  Stapler	\$1.51/item  Steel Clip

Plus 15% tax on all items

Which of the following groups of items, including 15% tax, can Juan afford to buy with his \$15.00?

- a One binder, one stapler and three steel clips
- b Two steel clips, two binders and two notebooks
- c One notebook, one stapler and one mechanical pencil
- d One binder, one glue stick and two mechanical pencils

8. An influenza virus has a surface area of  $0.000\,000\,05\text{ mm}^2$ .

What is this number expressed in scientific notation?

- a  $5 \times 10^{-7}\text{ mm}^2$   
 b  $5 \times 10^{-8}\text{ mm}^2$   
 c  $5 \times 10^7\text{ mm}^2$   
 d  $5 \times 10^8\text{ mm}^2$

9. Simplify fully:

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

- a  $2x^2 - 17x$   
 b  $2x^2 - 23x$   
 c  $17x^2 - 5x$   
 d  $17x^2 - 20x$

10. A pill contains  $1.75 \times 10^{-3}\text{ g}$  of calcium and  $1.25 \times 10^{-4}\text{ g}$  of iron.



What is the **combined mass** of the calcium and iron in the pill?

- a  $1.875 \times 10^{-3}\text{ g}$   
 b  $3.0 \times 10^{-3}\text{ g}$   
 c  $1.875 \times 10^{-7}\text{ g}$   
 d  $1.42 \times 10^{-4}\text{ g}$

11. The following tables express distance, in metres, as a function of time, in seconds.

Which table represents a **linear** relation?

a

Time (s)	Distance (m)
0	236
1	231
2	216
3	191

b

Time (s)	Distance (m)
0	1
1	2
2	4
3	8

c

Time (s)	Distance (m)
0	28
1	46
2	50
3	64

d

Time (s)	Distance (m)
0	16
1	12
2	8
3	4

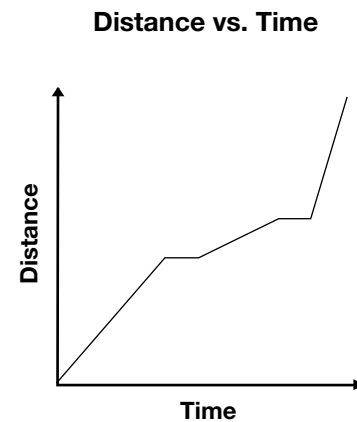
12. Inez created the following table of values based on a relationship between  $x$  and  $y$  and calculated the first differences. The values of  $y$  have been concealed.

$x$	$y$	First differences
11		-3
12		-3
13		-3
14		

Which statement describes the relationship between  $x$  and  $y$ ?

- a  $y$  increases linearly as  $x$  increases.
- b  $y$  decreases linearly as  $x$  increases.
- c  $y$  increases non-linearly as  $x$  increases.
- d  $y$  decreases non-linearly as  $x$  increases.

13. The graph below shows a runner's **distance** from the starting point of a race over time.



The runner

- a ran at 2 different speeds and took 3 breaks.
- b ran at 3 different speeds and took 2 breaks.
- c always ran at the same speed and took 2 breaks.
- d ran at 5 different speeds.

14. Sergio sells 7 models of CD players. The table shows the unit cost of each model and the number of CD players of that model sold in the past month.

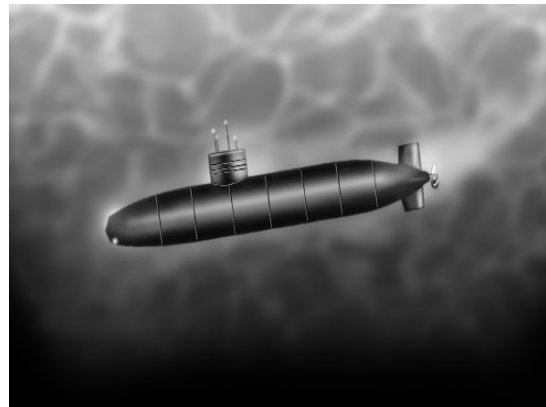
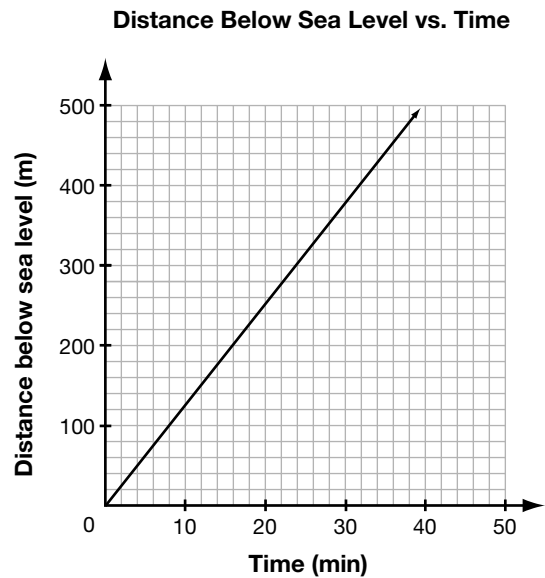
Model	Unit cost (\$)	Number sold
A	55	11
B	70	14
C	90	17
D	100	21
E	120	24
F	150	29
G	200	41



Which statement about the relationship between the unit cost and the number of CD players sold is **true**?

- a There is no relationship between the unit cost and the number sold.
- b As the unit cost increases, the number sold decreases.
- c As the unit cost increases, the number sold is constant.
- d As the unit cost increases, the number sold increases.

15. A submarine is submerging. The graph shows the distance below sea level the submarine has descended over time.



How far below sea level has the submarine descended after 24 min?

- a 300 m
- b 325 m
- c 350 m
- d 375 m

16. Natasha works for a computer company. The table shows her annual salary in the last five years.

Year	Annual salary (\$)
1	32 000
2	33 600
3	35 200
4	36 800
5	38 400

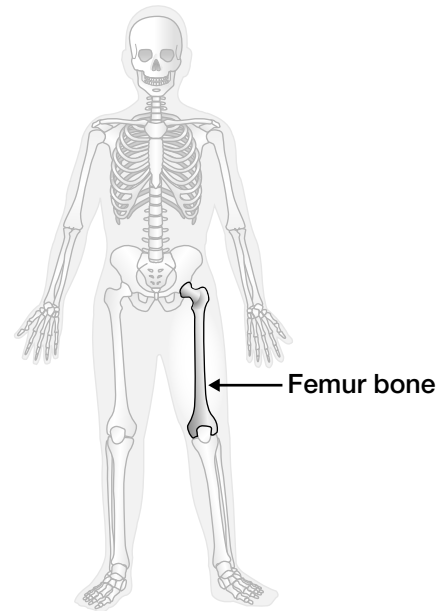


If the trend continues, what will Natasha's annual salary be in the 8th year?

- a \$40 000
- b \$43 200
- c \$46 400
- d \$49 600

17. Scientists find that the height of a person,  $h$ , in centimetres, is related to the length of the person's femur bone,  $f$ , in centimetres, according to the following formula:

$$h = 69.09 + 2.24f$$

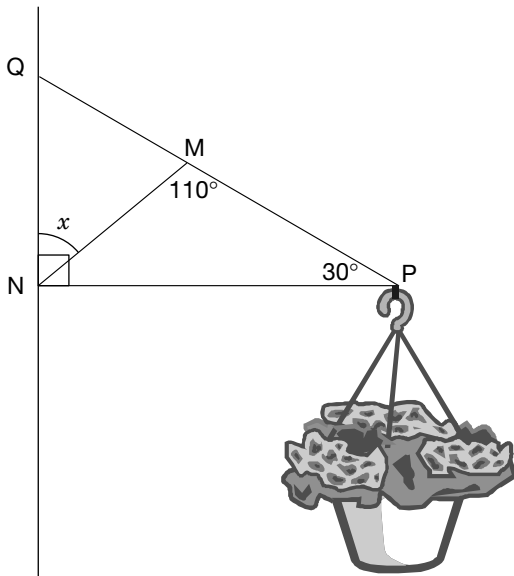


According to the formula, what is **the height** of a person with a femur bone of 48.6 cm in length?

- a 109 cm
- b 178 cm
- c 186 cm
- d 347 cm

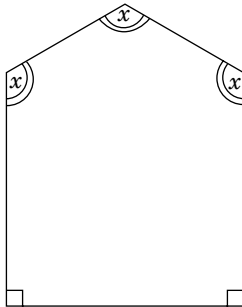


18. A flowerpot hangs from a brace.  
 $\triangle MNQ$  and  $\triangle MNP$  form the brace.



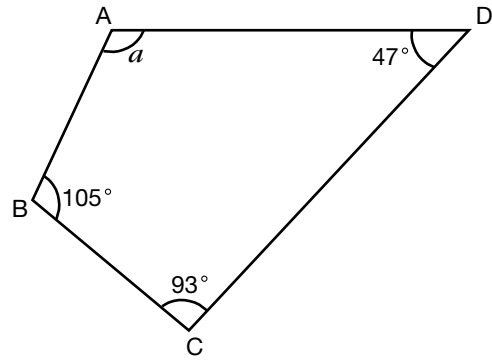
What is the value of  $x$ ?

- a  $22^\circ$
  - b  $30^\circ$
  - c  $40^\circ$
  - d  $50^\circ$
19. What is the measure of  $x$ ?



- a  $95^\circ$
- b  $110^\circ$
- c  $120^\circ$
- d  $132^\circ$

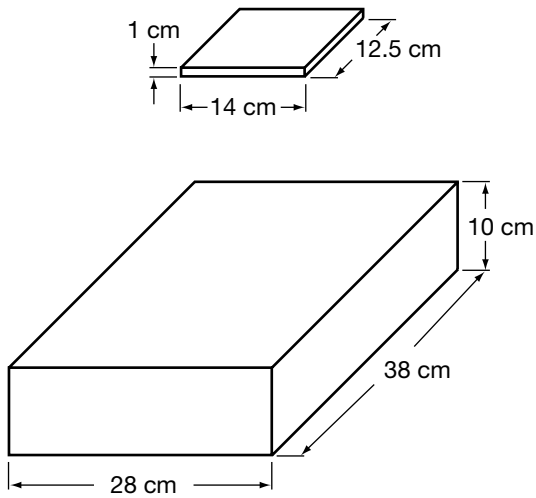
20. ABCD is a quadrilateral.



What is the value of  $a$ ?

- a  $105^\circ$
- b  $115^\circ$
- c  $120^\circ$
- d  $125^\circ$

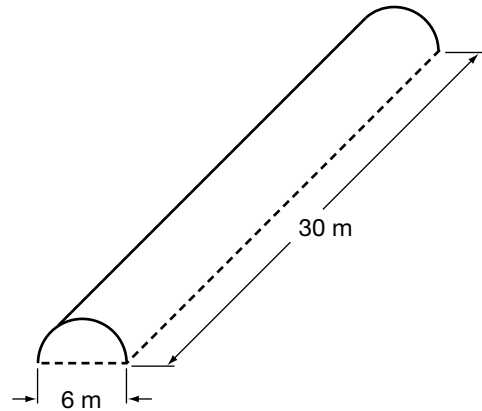
- 21.** Elisa wants to pack CD cases into a storage box.



What is the largest number of CD cases Elisa can pack inside the covered storage box?

- a** about 40
- b** about 50
- c** about 60
- d** about 70

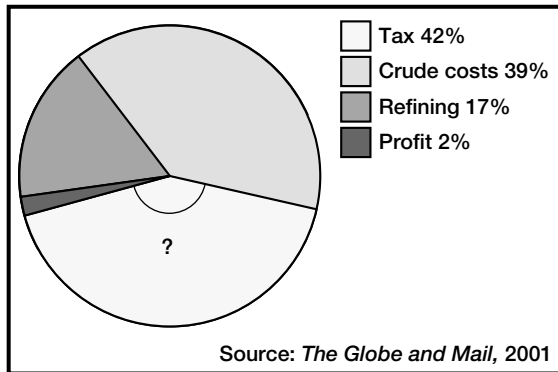
- 22.** The figure shows a greenhouse roof in the shape of half a cylinder.



What is the approximate surface area of the curved roof?

- a** 283 m<sup>2</sup>
- b** 424 m<sup>2</sup>
- c** 565 m<sup>2</sup>
- d** 848 m<sup>2</sup>

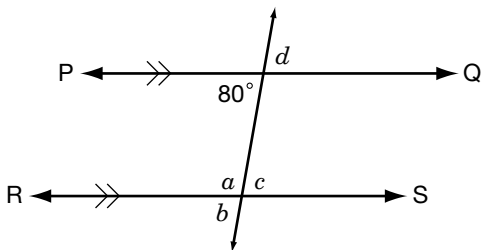
23. The circle graph shows the breakdown of the price of gasoline in Ontario in 2001.



What is the approximate measure of the marked angle?

- a 60°
- b 90°
- c 110°
- d 150°

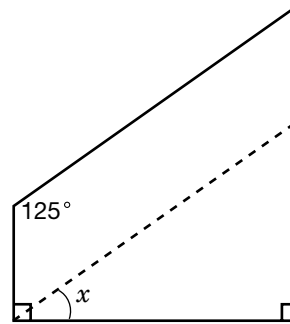
24. In the figure, PQ is parallel to RS.



Which of the following angles has a measure equal to 100°?

- a a
- b b
- c c
- d d

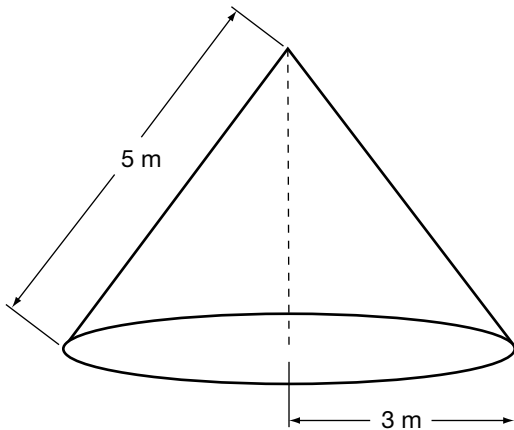
25. Teresa needs to cut a piece of wood in order to make a parallelogram. She marks a line on the wood where she will cut.



What is the size of angle  $x$ ?

- a 25°
- b 35°
- c 45°
- d 55°

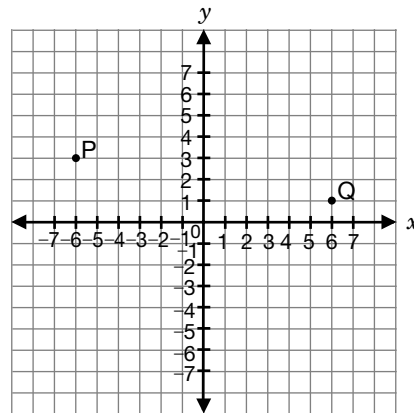
26. A tent has the shape of a cone. The radius of the base is 3 m, and the slant height is 5 m.



What is the approximate surface area of the tent, including the floor?

- a  $38 \text{ m}^2$
- b  $48 \text{ m}^2$
- c  $75 \text{ m}^2$
- d  $95 \text{ m}^2$

27. P is the point  $(-6, 3)$  and Q is the point  $(6, 1)$ .



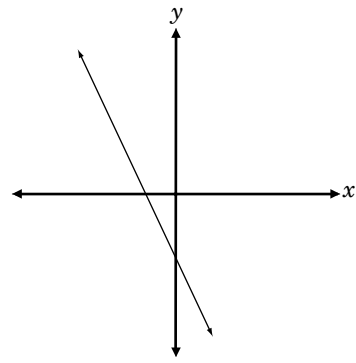
Which statement about the line segment PQ is **true**?

- a It has a positive slope.
- b It has a negative slope.
- c It has a slope of 0.
- d It is parallel to the y-axis.

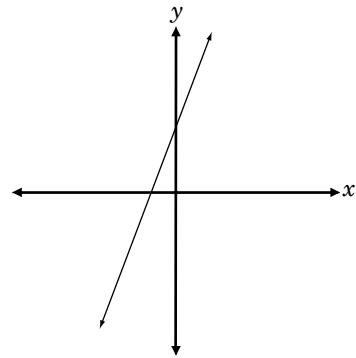
28. Which of the following graphs best represents the line with

- a slope of 3 and
- a  $y$ -intercept of  $-2$ ?

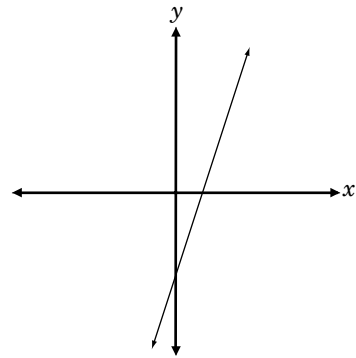
**a**



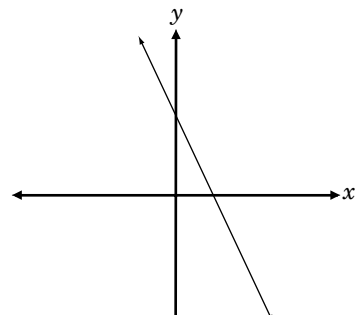
**b**



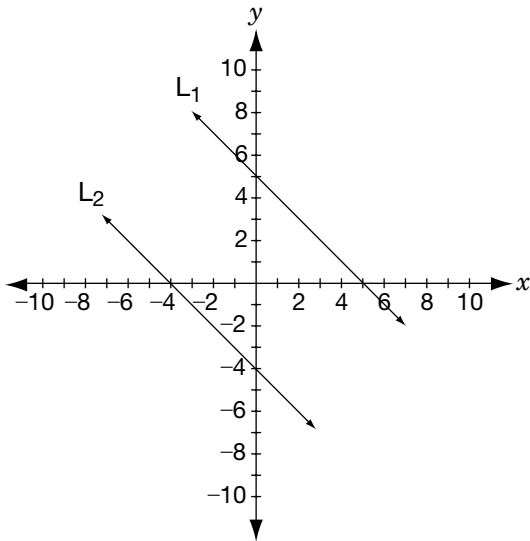
**c**



**d**

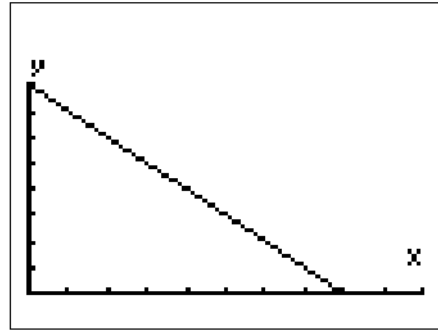


29. Which pair of equations best matches the lines shown on the graph?



- a  $L_1: y = x + 5$   
 $L_2: y = x - 4$
- b  $L_1: y = x + 5$   
 $L_2: y = -x + 4$
- c  $L_1: y = -x + 5$   
 $L_2: y = x - 2$
- d  $L_1: y = -x + 5$   
 $L_2: y = -x - 4$

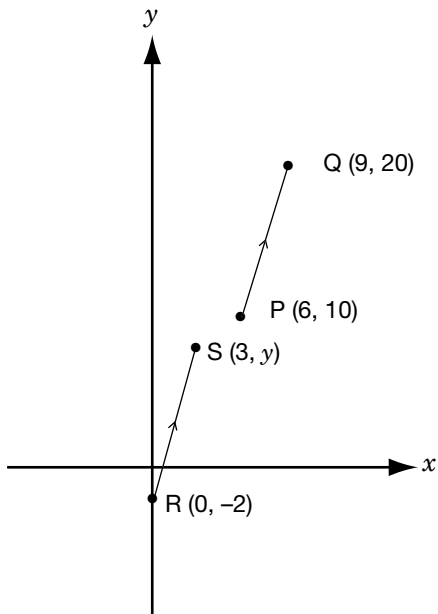
30. Study the display on Marie's graphing calculator.



Which statement describes the relation between  $x$  and  $y$ ?

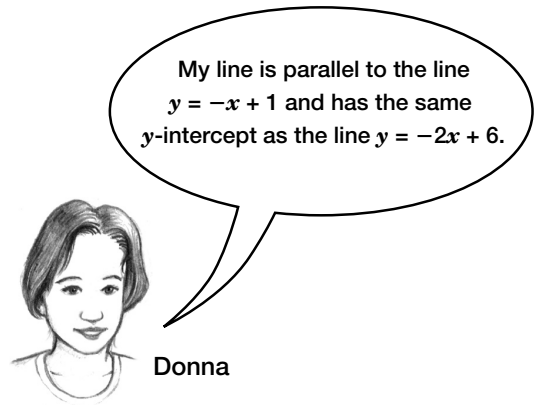
- a  $y$  increases linearly as  $x$  increases.
- b  $y$  decreases linearly as  $x$  increases.
- c  $y$  increases non-linearly as  $x$  increases.
- d  $y$  decreases non-linearly as  $x$  increases.

31. PQ and RS are parallel line segments.  
What is the value of  $y$ ?



- a 5
- b 6
- c 7
- d 8

32. Donna has correctly drawn a line on an  $xy$ -plane.



Which of the following equations represents the line that Donna has drawn?

- a  $y = x + 3$
- b  $y = x + 6$
- c  $y = -x + 6$
- d  $y = -x + 3$

