

Practice Exam #2-C2

Part A Questions 1 to 6

In the *Student Booklet*, darken the letter that corresponds to your answer.

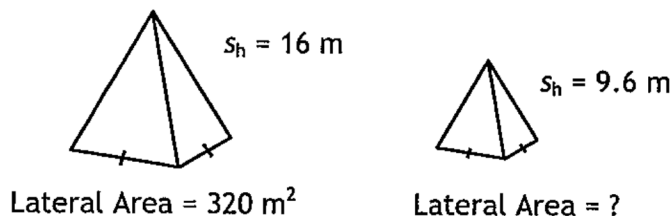
Each question is worth 4 marks.

1. Which interval notation represents the solution set of the inequality below?

$$-2x + 5 \leq 11$$

- A) $[3, +\infty[$ C) $] -\infty, -3]$
B) $] -\infty, 3]$ D) $[-3, +\infty[$

2. Two square based pyramids are similar. The lateral area of the larger pyramid is 320 m^2 .
The slant height of the larger pyramid is 16 m.
The slant height of the smaller pyramid is 9.6 m.



What is the lateral area of the smaller pyramid?

- A) 69.12 m^2 C) 160 m^2
B) 115.2 m^2 D) 192 m^2

3. What is the simplified algebraic expression?

$$\frac{(4x - 8)(3x + 6)}{6}$$

A) $2x^2 + 8x - 8$

C) $2x^2 - 8$

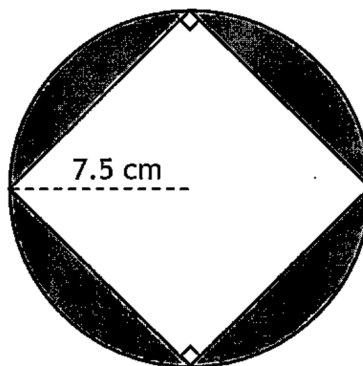
B) $2x^2 + 8$

D) $6x^2 - 42$

4. On the target below, the square is inside the circle.

The radius of the circle is 7.5 cm.

A point is chosen at random.



What is the probability, to the nearest percentage, that this point is in the shaded area?

Note: Use $\pi = 3.14$

A) 32%

C) 64%

B) 36%

D) 68%

54. What is the answer to the following in correct scientific notation?

$$(0.95 \times 10^{-5}) \bullet (25.6 \times 10^3)$$

A) 2.432×10^{-3}

C) 2.432×10^{-1}

B) 2.432×10^{-14}

D) 24.32×10^{-2}

6. In Brenda's Science class, the calculations of her term mark are shown in the table below. However, her Test 1 mark is missing.

Term Content (Weighting)	Brenda's Marks
Project (40%)	70
Test 1 (15%)	?
Test 2 (25%)	73
Quiz 1 (5%)	40
Quiz 2 (5%)	80
Assignment (10%)	90
TERM MARK	71

What is Brenda's mark for Test 1?

A) 65%

C) 71%

B) 55%

D) 73%

Part B Questions 7 to 10

In the *Student Booklet*, write your answer in the space provided.

Each question is worth 4 marks.

7. There are 26 students in Christian's class.

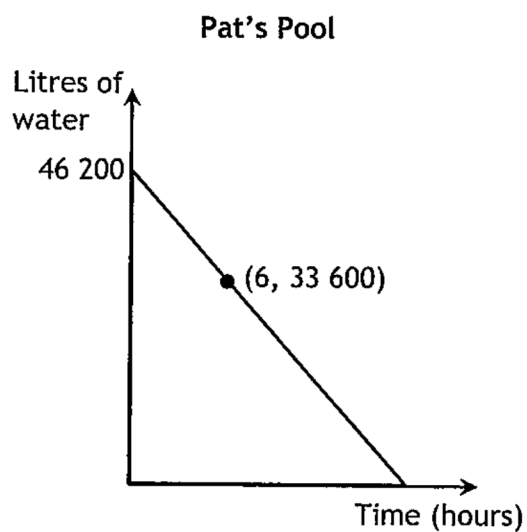
Christian's term mark for math is 81%.

The marks of the entire class, including Christian's, are below:

45	50	50	55	60	62	64
65	68	70	70	74	74	76
80	80	80	81	82	84	86
86	88	90	92	98		

- a) What is the interquartile range (IR)?
- b) In which quarter is Christian's mark located?

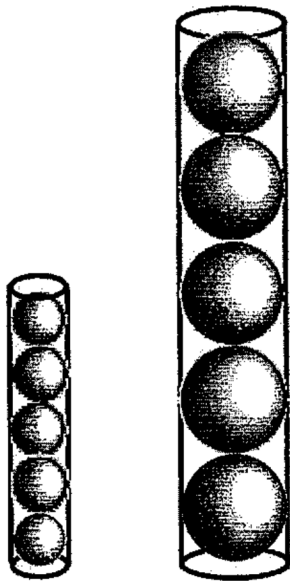
8. In the Fall, Pat needs to drain her swimming pool using a small garden hose. The pool holds 46 200 litres of water, the pool drains at a constant rate. After 6 hours, 33 600 litres of water remain in the pool.



After how many hours will the swimming pool be empty?

9. A company makes 2 sizes of spherical ornaments: large and small.
The ornaments are sold in similar cylindrical containers.

- The area of 1 small ornament is 78.5 cm^2 .
- The volume of the small cylinder is 490.625 cm^3 .
- The volume of the large cylinder is 3925 cm^3 .



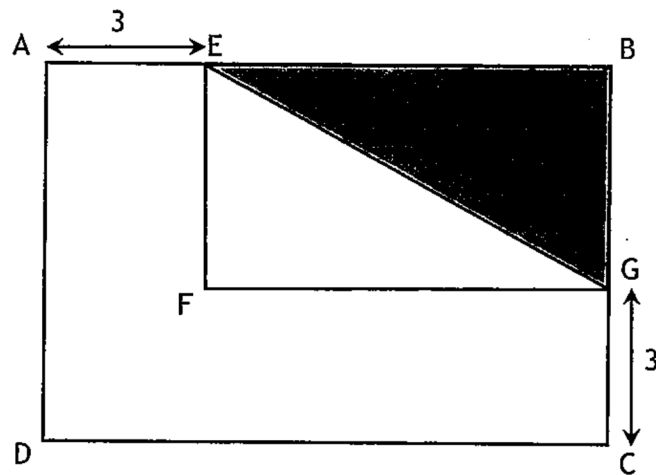
$$V = 490.625 \text{ cm}^3 \quad V = 3925 \text{ cm}^3$$

What is the radius of the large cylinder?

Note: use $\pi = 3.14$

10. The area of rectangle ABCD is $12x^2 + 9x$.

Side \overline{AD} is the GCF (greatest common factor) of $12x^2 + 9x$.



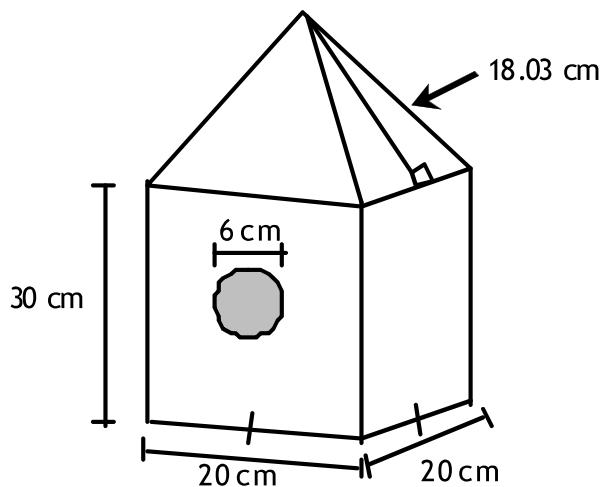
What algebraic expression represents the area of triangle BEG?

11. Amy and Jimmy were talking about wakeboarding in the summer. Amy likes to go to Lake Brunet Boating Club. The Club charges a certain amount per hour to wakeboard and a fixed amount for equipment rental. Three hours of wakeboarding costs \$205. Five hours of wakeboarding costs \$325. Jimmy wakeboards at the Centre de Plein Air in the Laurentians. The cost of wakeboarding at Centre de Plein Air is \$50 per hour plus \$45 to rent the equipment.

After how many hours of wakeboarding would it cost the same at both wakeboarding facilities and what would that cost be?

12. Students in a woodworking class made birdhouses. Karen is painting the outside of her birdhouse red. She needs to calculate the surface area of the birdhouse to know how much paint is needed. The birdhouse has a square base.

- The shaded hole has a diameter of 6 cm.
- The edge of the roof is 18.03 cm.



What is the total surface area of her birdhouse?

13. A survey was done across Quebec to see which cell phone apps (applications) were the most popular among teenagers and adults to download on their cell phones.

The mean is used to analyse the results of the survey.

There are 27 more men (18+) than women (18+) who downloaded a News/Weather app.

Below is the incomplete chart displaying the results.



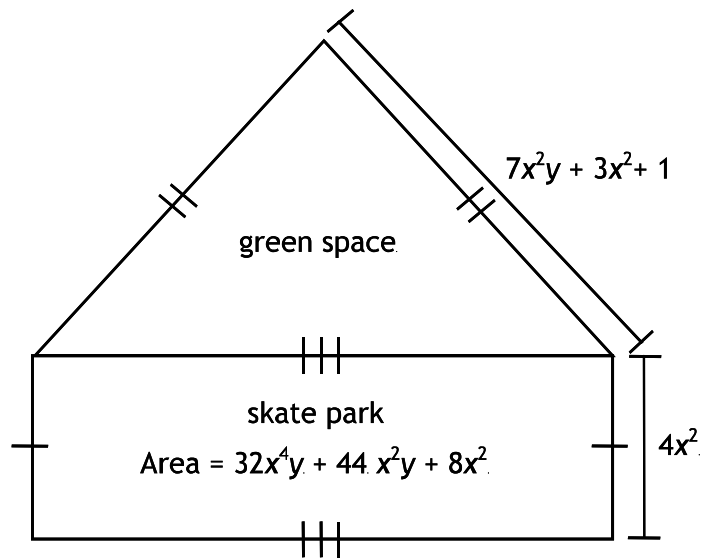
APPS Category \ Age	Boys 12-17	Girls 12-17	Men (18+)	Women (18+)	Mean of each APPS category
Games	1042	934	828	664	
Social Networks	688	675	613	480	
News/Weather	347	258			
Music	982	867	749	602	
Average of the means			666		

How many men (18+) subscribe to a News/Weather app?

14. Below is a rectangle representing the skate park. Connected to the skate park is a triangular green space.

- The area of the skate park is $32x^4y + 44x^2y + 8x^2$.
- The width of the rectangle is $4x^2$.
- One of the sides of the green space is $7x^2y + 3x^2 + 1$.

What is the difference between the perimeter of the green space and the perimeter of the skate park?



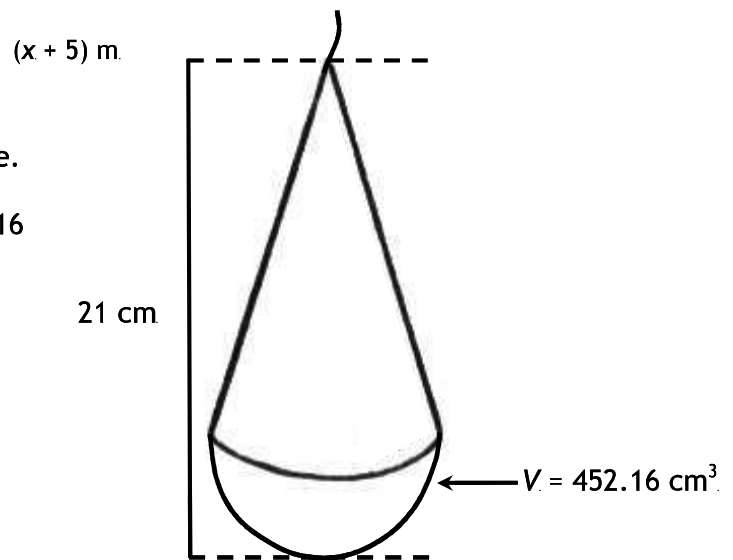
15. Students are making candles as part of their entrepreneurship project.

Each candle consists of a cone and a hemisphere.

- The volume of the hemisphere is 452.16 cm^3 .
- The total height of the candle is 21 cm.

The students must make 25 candles.

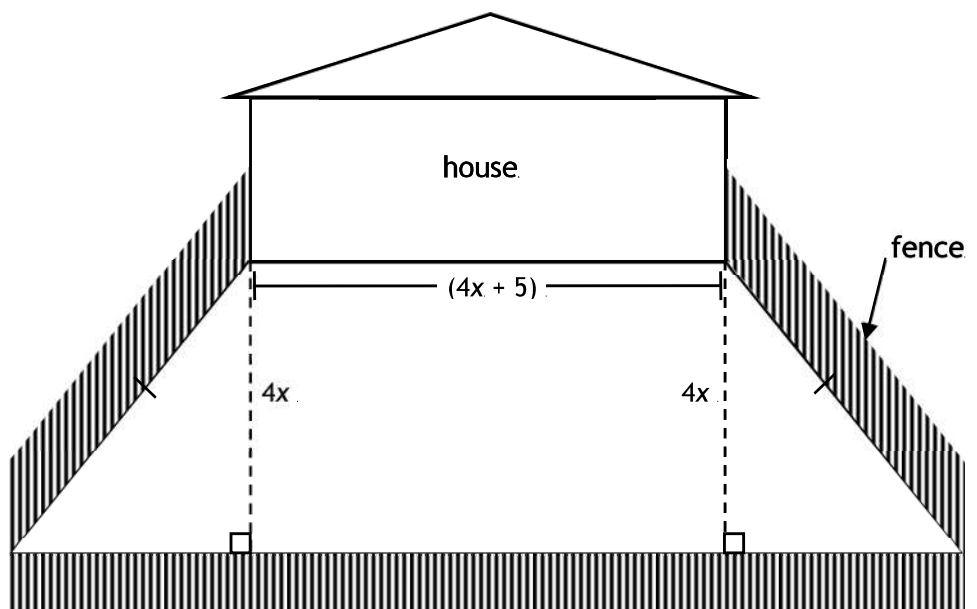
How many litres of wax will it take to make 25 candles? Note: Use $\pi = 3.14$



16. The backyard below is in the shape of an isosceles trapezoid and its area is $(28x^2 + 20x)$ square metres. The yard is fenced in on three sides.

- The height of the trapezoid in metres is $4x$.
- The width of the house in metres is $(4x + 5)$.

Which binomial represents the length of the fence needed to surround the backyard?



Part A

Questions 1 to 6

Darken the letter that corresponds to your answer.

Each question is worth 4 marks.

1. [A] [B] [C] ☒
2. [A] ☒ [C] [D]
3. [A] [B] ☒ [D]
4. [A] ☒ [C] [D]
5. [A] [B] ☒ [D]
6. ☒ [B] [C] [D]

Name : Anne Serkey

Date : _____

Booklet # : _____

40

Part B

Questions 7 to 10

Write your answer in the space provided.

Each question is worth 4 marks.

7. a) The interquartile range (IR) is 20 ($84 - 64$)

2	0
---	---
- b) Christian's mark is located in the 3rd quarter.

2	0
---	---
8. The swimming pool is empty after 22 hours.

4	0
---	---
9. The radius of the large cylinder is 5 cm.

4	0
---	---
10. The algebraic expression representing triangle BEG is $6x^2 - 6x$.

4	0
---	---

#7. min = 45 $Q_1 = \underline{64}$ $Q_2 = 75$ $Q_3 = \underline{84}$ max = 98

a) IR = $84 - 64 = \underline{20}$

b) he is in 3rd quarter

#8. $a = \frac{46200 - 33600}{0 - 6} = \frac{12600}{-6} = -2100$

to drain all 46200 l : $\frac{46200}{2100}$
 $= \underline{22 \text{ hrs}}$

#9. $k^3 = \frac{3925}{490.625} = 8$

So $k = \underline{2}$ & $k^2 = \underline{4}$

$A = 4\pi r^2$
 $78.5 = 4(3.14)r^2$
 $6.25 = r^2$
 $r = \underline{2.5}$

Big radius is 2 times

$\underline{r = 5}$

#10. $\overline{AD} = \text{GCF of } 12x^2 + 9x = \underline{3x}$

So $AD = 3x$; $AB = \frac{12x^2 + 9x}{3x} = 4x + 3$

$EB = 4x + 3 - 3 = 4x$

$BG = 3x - 3 = 3x - 3$

Area of BEG = $\frac{bh}{2} = \frac{4x(3x-3)}{2} = \frac{12x^2 - 12x}{2}$

$= \underline{6x^2 - 6x}$

11. Wakeboarding

➤ Lake Brunet Boating Club

(3 hours, \$205) (5 hours, \$325)

$y = ax + b$ where x = number of hours
 y = cost of wakeboarding

$$a = \frac{y_2 - y_1}{x_2 - x_1} = \frac{325 - 205}{5 - 3} = \frac{120}{2} = 60$$

$$205 = 60(3) + b$$

$$205 = 180 + b$$

$$b = 25$$

$$y = 60x + 25$$

➤ System of Equations

Wakeboarding at Lake Brunet: $y = 60x + 25$

Centre de Plein Air: $y = 50x + 45$

➤ Solving the System of Equations

$$60x + 25 = 50x + 45$$

$$10x = 20$$

$$x = 2 \text{ hours}$$

➤ Calculation of Cost

$$y = 50(2) + 45$$

$$y = 100 + 45$$

$$y = 145$$

$$y = 60(2) + 25$$

$$y = 120 + 25$$

$$y = 145$$

➤ Conclusion

After **2 hours** of wakeboarding,
the cost would be **\$145** at both facilities.

12. Calculation of slant height

$$c^2 = a^2 + b^2$$

$$18.03^2 = a^2 + 10^2$$

$$325.0809^2 = a^2 + 100$$

$$a^2 = 325.0809 - 100$$

$$= 225.0809$$

$$a = \sqrt{225.0809}$$

$$= 15 \text{ cm}$$

➤ Lateral Area of pyramid

Lateral Area of pyramid =
perimeter of base • slant height

$$\text{Pyramid LA} = \frac{(20 \times 4) \cdot (15)}{2} = 600 \text{ cm}^2$$

➤ Lateral Area of prism

Lateral Area of prism = (perimeter of base x height)

$$\text{Prism LA} = (20 \times 4) \cdot (30) = 2400 \text{ cm}^2$$

➤ Area of the prism's base

$$A(\text{base}) = 20^2 = 400 \text{ cm}^2$$

➤ Total Area

$$\text{Total Area} = 600 + 2400 + 400 = 3400 \text{ cm}^2$$

➤ Area of Hole

$$\text{Area of hole} = \pi \cdot 3^2 = 28.2743 \text{ cm}^2$$

➤ Total Painted Area

$$3400 \text{ cm}^2 - 28.2743 \text{ cm}^2 = 3371.726 \text{ cm}^2$$

➤ Conclusion

The total surface area of the birdhouse is
3371.726 cm² or 3371.73 cm² or 3371.7 cm².
Do not penalize students who did not round correctly.

13. Mean of each App

$$\text{Games} = \frac{(1042 + 934 + 828 + 664)}{4} = 867$$

$$\text{Social Networks} = \frac{(688 + 675 + 613 + 480)}{4} = 614$$

News/Weather = x

$$\text{Music} = \frac{(982 + 867 + 749 + 602)}{4} = 800$$

➤ Mean of News/Weather App

$$\text{Average of the Means} = \frac{(867 + 614 + x + 800)}{4} = 666$$

$$\frac{2281 + x}{4} = 666$$

$$2281 + x = 2664$$

$$x = 383$$

➤ Number of men 18+ in News/Weather category

y = number of women 18+ in News/Weather category

$y + 27$ = number of men 18+ in News/Weather category

$$\text{News/Weather} = \frac{347 + 258 + y + 27 + y}{4} = 383$$

$$\frac{632 + 2y}{4} = 383$$

$$632 + 2y = 1532$$

$$2y = 900$$

$$y = 450 \text{ women}$$

$$450 + 27 = 477 \text{ men}$$

Age APPS	Boys 12- 17	Girls 12- 17	Men 18+	Women 18+	Mean of each APPS category
Games	1042	934	828	664	867
Social Networks	688	675	613	480	614
News/Weather	347	258	477	450	383
Music	982	867	749	602	800
Average of the means					666

➤ **Conclusion**

477 men (18+) subscribe to a News/Weather app.

14. Length of Skate Park

$$L = \frac{32x^4y + 44x^2y + 8x^2}{4x^2}$$

$$L = 8x^2y + 11y + 2$$

➤ **Perimeter of Skate Park**

$$P = 2(8x^2y + 11y + 2) + 2(4x^2)$$

$$P = 16x^2y + 22y + 4 + 8x^2$$

$$P = 16x^2y + 8x^2 + 22y + 4$$

➤ **Perimeter of Green Space**

$$P = 2(7x^2y + 3x^2 + 1) + 8x^2y + 11y + 2$$

$$P = 14x^2y + 6x^2 + 2 + 8x^2y + 11y + 2$$

$$P = 22x^2y + 6x^2 + 11y + 4$$

➤ **Difference of Perimeters**

$$22x^2y + 6x^2 + 11y + 4 - (16x^2y + 8x^2 + 22y + 4)$$

$$\text{Difference of Perimeters} = 6x^2y - 2x^2 - 11y$$

➤ **Conclusion**

The difference between the perimeter of the green space and the perimeter of the skate park is $(6x^2y - 2x^2 - 11y)$ or $(-6x^2y + 2x^2 + 11y)$.

15. Radius of Hemisphere

$$V_{\text{hemisphere}} = \frac{2\pi r^3}{3}$$

$$452.16 = \frac{2 \cdot 3.14r^3}{3}$$

$$\frac{3 \cdot 452.16}{2 \cdot 3.14} = r^3$$

$$216 = r^3$$

$$6 \text{ cm} = \text{radius}$$

➤ **Height of Cone**

Total height of the candle – radius

$$21\text{cm} - 6\text{cm} = 15 \text{ cm}$$

➤ **Volume of Cone**

$$V_{\text{cone}} = \frac{\pi r^2 \cdot h}{3}$$

$$= \frac{\pi(6)^2 \cdot 15}{3}$$

$$= 565.2 \text{ cm}^3$$

➤ **Total Volume of Candle**

$$452.16 + 565.2 = 1017.36 \text{ cm}^3$$

➤ **Conversion of Volume to Capacity**

$$1017.36 \text{ L} \div 1000 = 1.01736 \text{ L}$$

➤ **Total Capacity of 25 Candles**

$$1.01736 \times 25 = 25.434 \text{ L}$$

➤ **Conclusion**

It will take **25.434 L** of wax to make 25 candles. Do not penalize students who did not round correctly.

16. Find the large base of the trapezoid

$$A = \frac{(B + b) \cdot h}{2}$$

$$28x^2 + 20x = \frac{(B + (4x + 5)) \cdot 4x}{2}$$

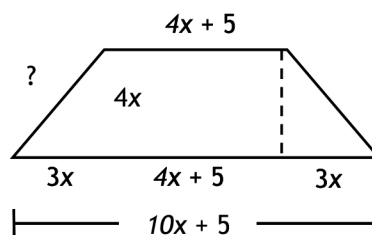
$$2 \cdot (28x^2 + 20x) = \frac{((B + (4x + 5)) \cdot 4x) \cdot 2}{2}$$

$$\frac{56x^2 + 40x}{4x} = \frac{[B + (4x + 5)] \cdot 4x}{4x}$$

$$(14x + 10) = B + (4x + 5)$$

$$14x + 10 - 4x - 5 = B$$

$$10x + 5 = B$$



$$(10x + 5) - (4x + 5)$$

$$= 6x$$

$$6x \div 2 = 3x$$

$$a^2 + b^2 = c^2$$

$$(4x)^2 + (3x)^2 = c^2$$

$$16x^2 + 9x^2 = c^2$$

$$\sqrt{25x^2} = \sqrt{c^2}$$

$$(5x)m = c$$

Length of the fence

$$5x + 5x + 10x + 5 = \underline{\underline{(20x + 5) \text{ m}}}$$