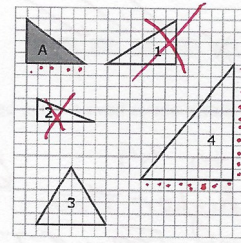[AB.9.SS.5]

How many lines of symmetry does the diagram shown above have?
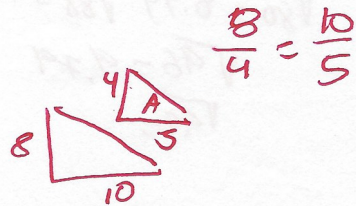
$$\boxed{4}$$ lines

[AB.9.SS.3]

Which triangle is similar to triangle A?

- ○ 1
- ○ 2
- ○ 3
- ● 4 *(circled)*

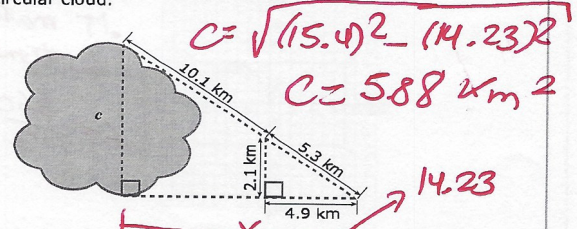*(handwritten)* $\frac{8}{4} = \frac{10}{5}$

[AB.9.SPr.4]

A store manager placed a discount coupon into only one of three differently coloured boxes. A customer was selected at random and was asked to choose one of the boxes. The customer chose the blue box because blue is her favourite colour. On what was the customer's decision based?

- ○ Theoretical probability
- ○ Mathematical calculation
- ● Subjective judgment *(circled)*
- ○ Experimental probability

[AB.9.SS.4]

In the diagram below, c represents the approximate distance across a circular cloud.

(handwritten) $C = \sqrt{(15.4)^2 - (14.23)^2}$
$C = 588\ km\ 2$
14.23

What is the approximate area of the cloud to the nearest square kilometre?

- ● 6 square kilometres *(selected)*
- ○ 29 square kilometres
- ○ 48 square kilometres
- ○ 117 square kilometres

(handwritten) $\frac{4.9}{5.3} = \frac{x}{15.4}$
$x = \frac{75.46}{5.3} = 14.23$

[AB.9.N.2]

If $(x^5)^2 \div x^8 = 196$, what is the value of x?

(handwritten) $\frac{x^{10}}{x^8} = x^{10-8} = x^2$
$x^2 = 196 \quad x = \sqrt{196}$
$x = 14$

$$\boxed{14}$$

[AB.9.PR.3]

The left and right sides of an equation are represented below. A legend for the equation is also given.

Legend

☐ = $-x^2$	▭ = $-x$	☐ = -1
■ = x^2	▬ = x	■ = 1

Left Side	Right Side

(handwritten) $3x - 2 = -2x + 3$
$5x = 5$
$3x + 2x = 3 + 2$
$x = \frac{5}{5} = 1$

How can the solution to the equation be represented?

- ○ ▬ = ☐
- ○ ▬ = ☐☐☐
- ● ▬ = ▬ *(circled)*
- ○ ▬ = ■■■

(handwritten) Each

[AB.9.N.5]

The square roots of two rational numbers are shown on the number line.

$$\sqrt{\tfrac{49}{81}} \qquad \sqrt{\tfrac{961}{36}}$$

A   C
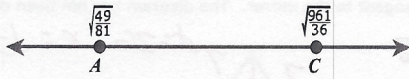
If point B is located on the number line between points A and C, which of the following could not represent B?

○ $\sqrt{\dfrac{289}{81}}$ $\dfrac{17}{9}$

○ $\sqrt{\dfrac{225}{16}}$

○ $\sqrt{\dfrac{121}{36}}$

● $\sqrt{\dfrac{169}{4}}$

(handwritten)
$\sqrt{\dfrac{49}{81}} = \dfrac{7}{9} \qquad \sqrt{\dfrac{961}{36}} = \dfrac{31}{6}$

$\downarrow 0.7 \qquad \downarrow 5.16$

$\sqrt{1.8} \to 3.75 \to 1.83$

$\sqrt{42.25} = 6.5$

[AB.9.N.3]

A keyboard has 60 keys, of which $\frac{1}{3}$ are grey, $\frac{1}{4}$ are black, and 7 are green. The rest of the keys are white. How many white keys does the keyboard have?

(handwritten)
$60 \times \tfrac{1}{3} = 20$ grey
$60 \times \tfrac{1}{4} = 15$ black
$= 7$ green
$60 - (20 + 15 + 7)$
$\boxed{18}$ are white

[AB.9.SS.1]

The diagram shows a swimming pool. The dots within the diagram represent floating buoys. The pool has a diameter of 20 metres.

(handwritten on diagram)
$d = 20$ m
$r = 10$ m
$x = \sqrt{10^2 - 6^2}$
$= \sqrt{100 - 36}$
$= \sqrt{64} = 8$
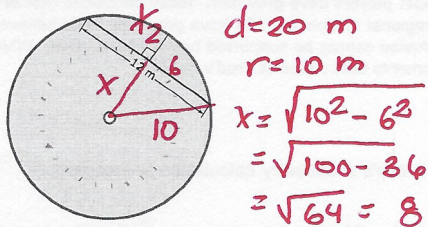
What is the shortest distance from the buoys to the edge of the pool?

○ 8 m

○ 6 m

○ 4 m

● 2 m

(handwritten)
$x_2 = \text{Radius} - x$
$= 10 - 8$
Shortest distance is 2 m

[AB.9.SPr.3]

Emily, Chelsea, and Alana donated some money to a charity. Emily donated three times as much as Alana. Chelsea donated $15 less than Alana. If the total amount they donated to charity is $75, how much money did Alana donate?
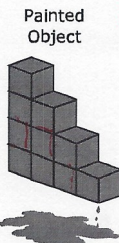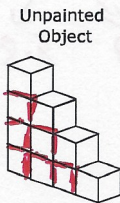
○ $3

● $18

○ $25

○ $54

(handwritten)
$E = 3A$
$C = A - 15$
$75 = A + E + C$
$75 = A + 3A + A - 15$
$75 + 15 = 5A$
$90 = 5A \Rightarrow A = \dfrac{90}{5}$
$\boxed{A = \$18}$

[AB.9.SS.2]

A 3-D object is made of cubes dipped in paint. Each cube is 2 cm x 2 cm x 2 cm.

Unpainted Object   Painted Object

(handwritten)
Each face
$A = 2 \times 2$
$= 4 \text{ cm}^2$

Unpainted are the overlaps
$12 \times 2 = 24$ face

If the painted object is separated into its individual cubes, what will be the total area of the unpainted surfaces?

○ 36 sq cm

● 96 sq cm

○ 40 sq cm

○ 144 sq cm

(handwritten)
24 faces × 4 cm² = 96 cm²

[AB.9.PR.5]

(handwritten) Re-arrange

Which pair of expressions are equivalent for all values of z?

(handwritten)
$-5z^2 + 4z + 3$
$5z^2 + 4z - 3$

○ $4z - 5z^2 + 3$ and $5z^2 - 3 + 4z$
   $5z^2 - 4z + 3 \qquad 5z^2 + 4z - 3$

○ $3 - 4z + 5z^2$ and $4z - 3 + 5z^2$
   $5z^2 - 4z + 3 \qquad -5z^2 + 4z + 3$

○ $3 + 5z^2 - 4z$ and $-5z^2 + 4z + 3$
   $5z^2 - 4z + 3$

● $-4z + 3 + 5z^2$ and $3 + 5z^2 - 4z$
   $5z^2 - 4z + 3$

[AB.9.PR.4]

(handwritten: X > 2 on diagram I; X < 2 on diagram II; X > 2 on diagram III; X < 2 on diagram IV; "2 is heavier")
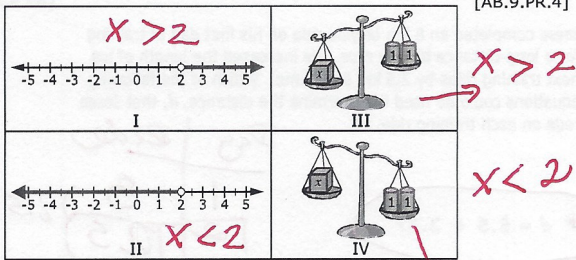
Which two diagrams shown above **both** represent the inequality $x < 2$?

○ I and II

◉ II and IV *(circled)*

○ II and III

○ III and IV

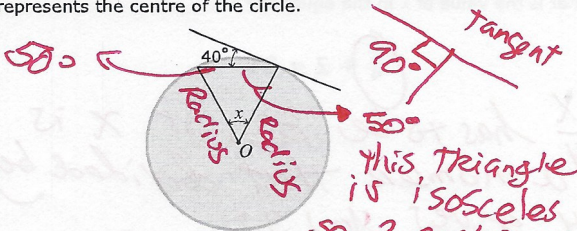**[AB.9.N.1]**

Which of the following sets of powers is arranged in order of increasing value from left to right?

○ $(-2)^2, (-3)^2, -2^2, -3^2$ *(marked X)*

◉ $-3^2, -2^2, (-2)^2, (-3)^2$ *(circled; handwritten: -9 -4 4 9)*

○ $-3^2, (-3)^2, -2^2, (-2)^2$ *(marked X)*

○ $(-2)^2, -2^2, (-3)^2, -3^2$

[AB.9.SS.1]

The following diagram has **not** been drawn to scale. The letter O represents the centre of the circle.

(handwritten: 50°, tangent, 90°, 50°, Radius, Radius, "this triangle is isosceles so 2 angles are equal")

If the line shown is tangent to the circle, what is the measure of angle x?

(handwritten: then $X° = 180° - (50+50) = 80°$)

◉ 80 degrees *(circled)*   ○ 60 degrees

○ 40 degrees   ○ 20 degrees

[AB.9.N.4]

Justin is going to buy a used car for $850 (including GST). He can choose between two payment plans.

    Plan A Pay $150 now and $25 each month
    Plan B Pay $400 now and $45 each month

How many **fewer** payments could Justin make if he chooses Plan B?

(handwritten:
A $850 = 150 + 25X$
B $850 = 400 + 45X$
(A) $25x = 850 - 150$
$x = \frac{600}{25} = 24$
(B) $= 45x = 850 - 400$
$45x = 450 \rightarrow x = 10$
difference 14)

○ 28

○ 18

○ 13

○ 10

[AB.9.N.4]

Two different expressions are simplified below.

Expression A	Expression A
$(2^3)^2 + 5^2 - 5^2 \times (-4)^2$	$3^6 \div 3^3 + (-4^2) \times 2$
$= 2^6 + 5^2 - 5^2 \times (-4)^2$	$= 3^2 + (-4^2) \times 2$
$= 64 + 25 - 25 \times 16$	$= 9 + (-16) \times 2$
$= 64 + 25 - 400$	$= 9 - 32$
$= -311$	$= -23$

(handwritten: B; $\frac{3^6}{3^3} = 3^{6-3} = 3^3$; "Incorrect!")

Which of the following statements about the simplifications shown above is true?

◉ The simplification of Expression A is correct, and the simplification of Expression B is incorrect. *(circled)*

○ The simplification of Expression A is incorrect, and the simplification of Expression B is correct. *(marked X)*

○ The simplifications of both expressions are incorrect. *(marked X)*

○ The simplifications of both expressions are correct. *(marked X)*

[AB.9.N.3]

How many whole numbers could represent the value of z in the following inequality statement?

$$\frac{1}{2} < \frac{5}{z} < 0.75$$

(handwritten:
$\frac{1 \times 2}{2 \times 2} < \frac{5}{z} < \frac{3}{4}$
$\frac{2}{4} < \square < \frac{3}{4}$
$0 \quad \frac{5}{100}$)

[AB.9.N.4]

Four students each simplified the following expression. The answers they found are shown below.

$$2 + 4 \times 5 - 7^3 \div (3 + 4)^2 \times 3$$

BEDMAS

$\rightarrow (7)^2 \quad -\dfrac{7^3}{7^2} = -7$

Student 1: 69
Student 2: 41
Student 3: 8
Student 4: 1

Which student simplified the expression correctly?

$2 + (4 \times 5) - (7 \times 3)$
$22 - 21 = 1$

- ○ Student 1
- ○ Student 2
- ○ Student 3
- ⦿ **Student 4**

[AB.9.PR.7]

The quotient of $(-16x^2 + 32x) \div \otimes x$ is $-4x + 8$.
What is the value of $\otimes$?

$$\dfrac{-16x^2 + 32x}{4x} = \dfrac{-16x^2}{4x} + \dfrac{32x}{4x}$$

$$= -4x + 8$$

$\boxed{4}$

[AB.9.N.3]

Three rational numbers are shown below.

A: -0.067

B: $-\dfrac{13}{3} = -4\dfrac{1}{3} = -4.33$

C: $-\dfrac{17}{4} = -4\dfrac{1}{4} = -4.25$

Which inequality represents these rational numbers?

- ○ $A < B < C$
- ○ $C < B < A$
- ⦿ **$B < C < A$**
- ○ $B < A < C$

[AB.9.N.3]

Jeff's cellphone plan charges him $0.07 per text message, $0.09 per minute of voice usage, and a $4.00 base fee each month. What is Jeff's cellphone bill if he sends 44 text messages and talks for 53 minutes in one month?
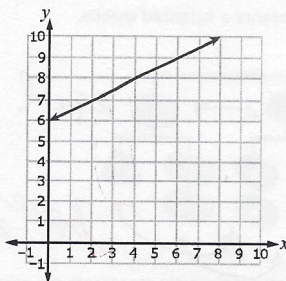
$0.07t + 0.09v + 4.00$

$0.07(44) + 0.09(53) + 4$

$3.08 + 4.77 + 4$

11.85

- ○ $11.67
- ⦿ **$11.85**
- ○ $17.86
- ○ $19.52

[AB.9.PR.2]

Which equation represents the linear relationship shown on the grid above?

x	y
0	6
2	7
4	8

- ⦿ **$y = 0.5x + 6$** → $x=0 \; y=6$ → $y = 0 + 6 = 6$ It fits!
- ○ $y = 0.5x - 6$
- ○ $y = 2x + 6$ → $x=0 \; y=6$ → $2x+6$ it fits
- ○ $y = 2x - 6$

[AB.9.PR.7]

Legend

☐ $= -x^2$	☐ $= -x$	☐ $= -1$	
⬛ $= x^2$	⬛ $= x$	⬛ $= 1$	

A model of division is shown above on the right. Which of the following polynomials represents the unknown expression?

$+4x^2 - 16x$
$\quad -4x$
$\boxed{-x + 4}$

- ○ $4 - x^2$
- ○ $-x^2 + 4$
- ○ $4 - x$
- ⦿ **$-x + 4$**