

Name _____ Date _____

IB Math Studies SL: Year Two

This summer, you will be working on your Internal Assessment for IB Math Studies SL. The rough draft of this IA will be due Friday, October 26, 2018. In the fall, you will be able to email me to schedule appointments for flex to discuss your IA as needed. We will meet in the fall to review your rough draft before you submit a final draft at the end of November.

The relevant IA tabs will be available to you all summer on my eBoard.

In addition to the IA, please complete the following packet before we return to the course in January.

Also, I suggest you spend some time before the second semester reviewing the material from the first half of the course.

IB Math Studies SL Review Packet Year Two

1. The profit P of a business that sells all n items it produces is given by the formula $P = Sn - Cn$, where S is the selling price and C is the cost price of each item.
 - a. Solve the formula for n .
 - b. Veronika is a jeweler. She imports watches for €205 and sells them for €215. How many must she sell to make €970 profit?
 - c. Solve the formula above for S .
 - d. Veronika also aims to make €360 from selling earrings. She estimates that she can sell 75 pairs of earrings, with production costs of €24.50 per pair. At what price should she sell the earrings?

2. Solve each of the following systems:

a.
$$\begin{cases} x + 3y = 7 \\ y = x + 5 \end{cases}$$

b.
$$\begin{cases} 6x - 2y = 26 \\ 2x + 3y = 5 \end{cases}$$

3. Expand and simplify:

a. $4x(5 - x)$

b. $(x - 9)(x + 4)$

c. $(x + 7)^2$

d. $(2 - x)(x + 3)$

e. $(x + 3)(x^2 + 2x + 4)$

f. $(3x + 2)(2x + 3)$

g. $7 - (x + 4)^2$

h. $(6x + 1)(x + 5) + (x - 2)^2$

i. $(x - 4)^3$

4. Factor each of the following completely:

a. $5x - 5$

b. $2x^2 + 6x + 8$

c. $x^2 + 5x + 6$

d. $w^2 + 4w - 21$

e. $r^2 - 25$

f. $2x^2 - 11x - 21$

g. $3m^2 + 10m + 3$

5. Solve each of the following for x :

a. $x^2 + 5x = 24$

b. $8x^2 + 2x - 3 = 0$

c. $2x^2 - 18 = 0$

d. $(x + 3)^2 = 5x + 29$

e. $2x^2 - 108 = 6x$

f. $-3x^2 + 5x + 14 = 0$

6. Simplify each of the following. Write your answer with positive exponents.

a. $\frac{m^9}{m^5}$

b. $4y^0$

c. $\left(\frac{7z^2}{w^3}\right)^{-2}$

d. 2^{-3}

e. $3^{-1} + 3^2$

f. $(ab^3)^6$

g. $(5p^3q)^2$

7. Find each of the following:

a. The exact perimeter and area of a rectangle whose dimensions are 100 m by 50 m.

b. The exact area of a triangle whose base is 22.5 cm and height is 10.4 cm.

c. The circumference of a circle with a diameter of 37 feet.

d. The area of a circle whose radius is 17 feet, giving your answer correct to 3 s.f.

e. The area of a trapezoid with bases 7.3 m and 13.6 m, and height of 15.9 m.

8. Given the following sets of ordered pairs, find a) the midpoint of the segment joining the two points, and b) the distance of that segment.

a. (3, 9) and (1, 5)

b. (-9, -5) and (3, -2)

9. Given A and M , the midpoint of \overline{AB} , find B .

a. $A(-2, -2)$, and $M(-2, 3)$

b. $A(3, 4)$, and $M(5, 7)$

Use special right triangles to find each of the following.

10. Find the remaining sides of a $30^\circ - 60^\circ - 90^\circ$ triangle if the short leg is 7 cm.
11. Find the length of the legs of a $30^\circ - 60^\circ - 90^\circ$ triangle if the hypotenuse is $2\sqrt{3}$.
12. Find the remaining sides of a $30^\circ - 60^\circ - 90^\circ$ triangle if the short leg is $5\sqrt{2}$ mm.
13. Find the remaining sides of a $30^\circ - 60^\circ - 90^\circ$ triangle if the long leg is 4 cm.
14. Find the remaining sides of a $45^\circ - 45^\circ - 90^\circ$ triangle if the hypotenuse measures $19\sqrt{2}$.
15. Find the remaining sides of a $45^\circ - 45^\circ - 90^\circ$ triangle if one leg measures $3\sqrt{5}$.

Sketch the triangle based on the given information and solve.

16. For the right triangle ABC, where C is a right angle, find the missing side length of the triangle if $AB = 14$ cm. and $BC = 7$ cm.
17. For the right triangle RST, where T is a right angle, find each of the following:
 - a. If $r = 6$ and $s = 8$, find the exact value of t .
 - b. If $r = 8$ and $s = 12$, find t correct to 1 decimal place.
 - c. If $r = 10$ and $t = 26$, find the exact value of s .

18. Which of the following could be the lengths of the sides of a right triangle?

a. 65, 72, 97

b. 20, 21, 27

c. 1, 1, 1.414

d. $1, \sqrt{2}, 1$

e. $\sqrt{3}, 1, 2$

f. $\frac{39}{7}, \frac{89}{7}, \frac{80}{7}$

19. Graph the following vertices of triangle ABC , with $A(-3, -2)$, $B(1, 5)$, and $C(5, -2)$.
Use this graph to answer the following:

a. Find the lengths of each side of $\triangle ABC$.

b. Find the perimeter of $\triangle ABC$.

c. Find the area of $\triangle ABC$.