IB Math Studies Prior Knowledge Enrichment Problems:

These problems are a review of the knowledge you will need to be successful in this class. These problems will be reviewed in August and will be tested at the end of the first two weeks of your return in the fall.

List all numbers from the given set of real numbers that are irrational numbers:

1) {10, $\sqrt{7}$, 7, -16, 0, 4/5, $\sqrt{25}$, 0.8888 repeating, 0.98}

Find the distance between the pairs of points

2) (5,3) and (-1, -5)
3) (4, -7) and (2, -3)
4) (0, -5) and (4, -5)

Find the midpoint of a line segment whose end points are given

5) (7, 8) and (3, 5)
6) (1, -6) and (8, -2)

Determine whether the given ordered pair is a solution to the system

7) (3, -4) + y = -7 – y = 1

Solve the system of equations by the substitution method

8) x + 2y = 2
   4x – 3y = -3

9) Find the value of 7% of 32 USD. Find the value of 4.5% of 12 GBP. Find the value of 25% of 750.28 EUR. Find the value of 130% of 8000 JPY.

10) In the UK, prices of some goods include a government tax called a VAT, which is at 29%. A TV is priced at 480 pounds before VAT. How much will it cost including VAT?

11) In a sale in a shop in Amsterdam, a dress that was priced at 1700 euros is reduced by 12.5%. What is the sale price of the dress?

12) The cost of a weekly train ticket goes up from 120 dollars to 128.40 dollars. What is the percentage increase?

13) An item appears in a sale marked as 15% off with a price tag of 27.20 dollars. What is the original price before the discount?

14) For a bake sale, a group of students decide to make brownies, chocolate chip cookies and pancakes in the ratio 5 : 3 : 2. They plan to make 150 items altogether. How many of each will they need to make?

15) A circle has a diameter of 10 centimeters. Find its area and circumference.

16) Write this English phrase as an equation: 52 less than x.

17) The length of a rectangular room is 8 feet longer than twice the width. If that room's perimeter is 184 feet, what are the room's dimensions?

18) True or false: $23 < -7$

Rewrite the expressions without absolute value bars:

19) $|(17) - 12|$
20) $||-1|- |-8||$

Evaluate the following expressions for the given values of x and y:

21) $|x|/x + |y|/y$; given $x = 6$ and $y = -1$
22) $3(x + 5) + 18 + y$; given $x = -10$ and $y = 0$
23) $y - 6x / 3x + xy$; given $x = -4$ and $y = 5$

State the name of the property illustrated.

24) $(6 + 4) + 3 = (4 + 6) + 3$
25) $2(x + 2) = 2x + 2 * 2$
26) $14 + (18 + 13) = (14 + 18) + 13$

27) Simplify: $(7z + 12) – (5z – 5)$

Evaluate the exponential functions:

28) -6^2
29) $(-2)^0$
30) 5^{-3}
31) $7^7 \times 7^3$
32) $(4^2)^3$

Simplify the exponential functions:

33) x^2y^{-2}
34) $x^5 * x^{12}$
35) $(x^6)^5$
36) $(x^5)^{-9}$

Evaluate the expression:

37) $(-100)^{1/2}$

Find the product:

38) $(2x – 11)(x – 7)$
39) $(4x – 7)(4x + 7)$
40) $(x – 14)^2$

Factor the trinomial:

41) $x^2 – x – 42$
42) $12x^2 + 7x – 12$

Find the difference of two squares:

43) $x^2 – 16$
44) $49x^2 – 36$

Solve and check the linear equation:

45) $9x – (8x – 1) = 2$

Solve the inequality and expression the solution using interval notation:

46) $-5x > -30$