NAME:_____

LAMBRICK PARK SECONDARY SCHOOL

Foundations of Mathematics and Pre-Calculus 10

PRACTICE FINAL EXAM

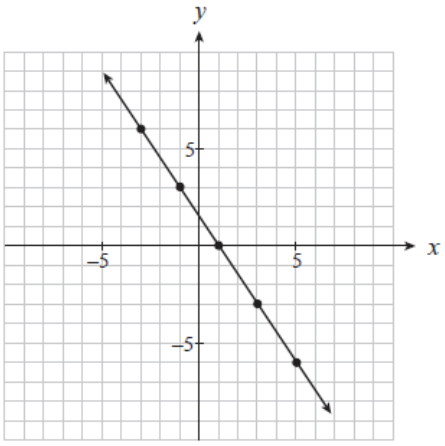
Jan. 2020

Instructions

1. When using your calculator (scientific or approved graphing calculator):
   - use the programmed value of π rather than the approximation of 3.14.
   - round only in the final step of the solution.
   - ensure that your calculator is set to DEGREE mode

2. Diagrams are not necessarily drawn to scale.

1. What is the **slope** of the following line?



Slope = _____

2. What is the equation of the line passing through $(-1, 10)$ and $(2, -2)$ in **slope – intercept** form?

3. If $f(x) = 5x + 6$, determine $f(-3)$.

4. What is the Greatest Common Factor of 72, 56, and 40?

5. Which of the following numbers are **Irrational**? $-\sqrt{16}, \pi, \sqrt[3]{64}, \sqrt{28}, -3.3333\ldots, \sqrt[3]{4}$

6. Simplify: $3\sqrt{50}$

7. Simplify: $(-27x)^{\frac{2}{3}}$

8. Factor: $16p^2 - 81q^2$

9. Determine the cube root, using the **grouping method**: $\sqrt[3]{91125}$
(2 marks)

10. Write as a mixed radial in its simplest form: $\sqrt{192}$
(2 marks)

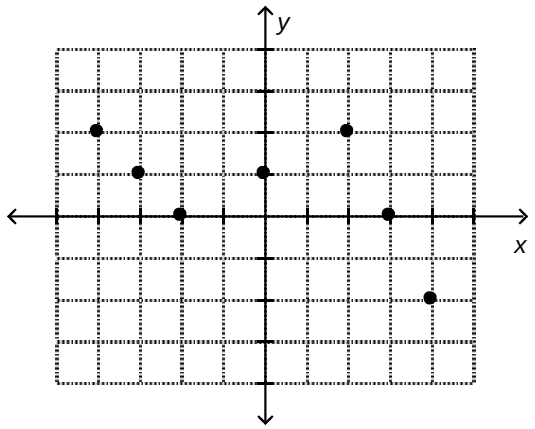
11. What is the **slope** and the **y-intercept** of the following? $3x - 4y + 4 = 0$

Slope:_____

y-intercept_____

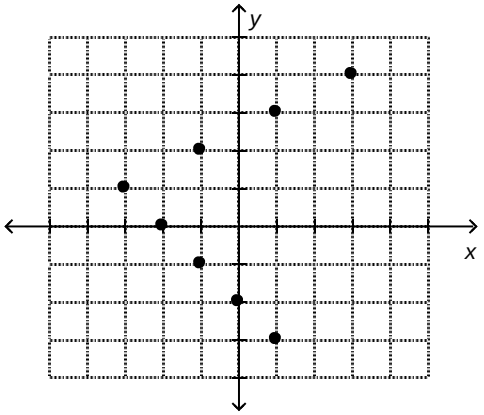
12. Are the following relations also **functions**?

A)



Function Y / N

B)

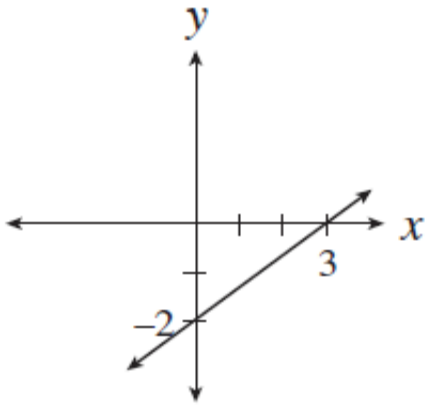


Function Y / N

13. A line segment has endpoints $A(-7, 3)$ and $B(8, -2)$. Determine the **slope** of AB.

SLOPE of AB:_____

14. What is the equation of the line below, in **STANDARD FORM**?



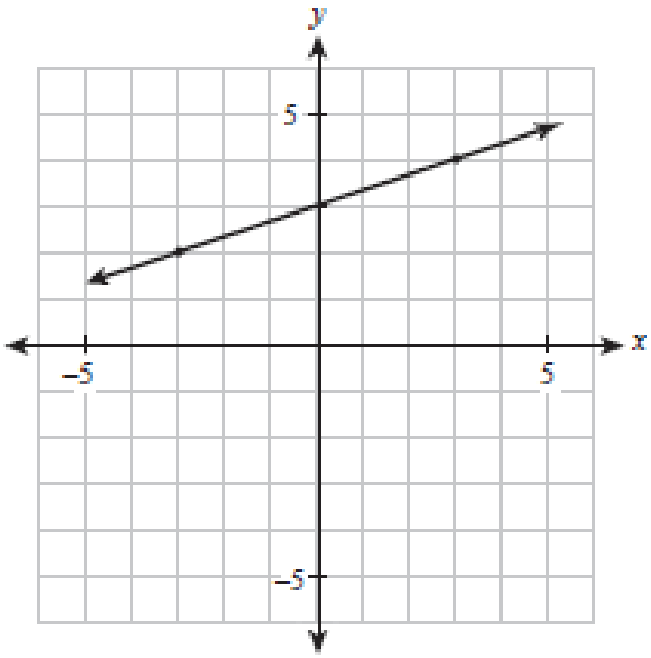
15. The slope of a line segment joining $M(-6,3)$ and $N(4,k)$ is $\frac{3}{5}$. Determine the value of k.

$k =$ _____

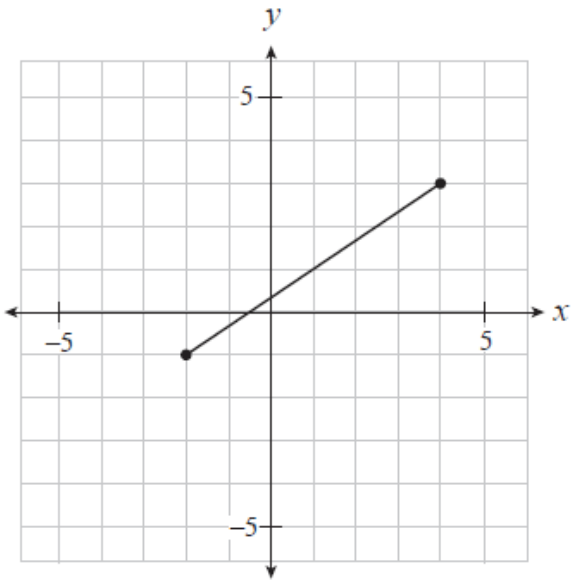
16. Determine an equation of the line passing through the point $(9,-3)$ and parallel to the line segment joining $A(4,7)$ *and* $B(1,5)$, in **slope – intercept** form.

17. Line AB passes through $(9, 3)$ *and* $(-4, 7)$. Line CD passes through $(4, -3)$ *and* $(8, 10)$. Are these lines **parallel, perpendicular, or neither**?

18. What is the equation of the line below, in **slope-intercept** form?



19. Determine the **range** of the following graph.



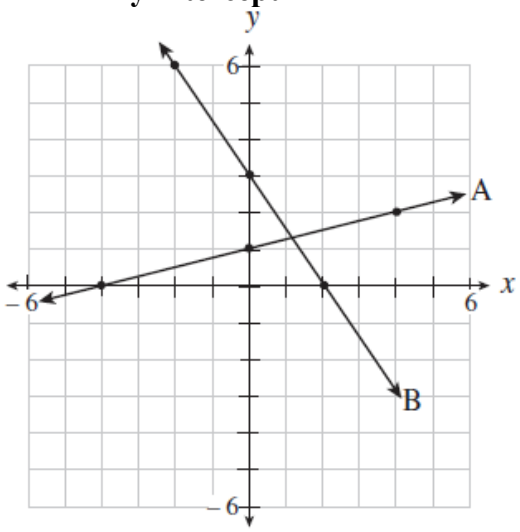
Range:_____

20. Determine the ***x*-intercept** and ***y*-intercept** of the graph of $9x + 6y = 72$

x-intercept:_____

y-intercept:_____

21. Write an equation for a line, in **standard form**, with the same **slope** as line A and the same **y-intercept** as line B?



22. The graph of $y = 4x + k$ has an x-intercept of $(-20, 0)$. Determine the value of k.

k = _____

23. Use the **substitution** OR **elimination** method to find the solution to the following linear system:

$$-6x + y = 21 \qquad \text{and} \qquad x + 9y = 24$$

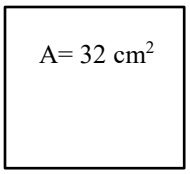
24. There is a collection of nickels and dimes. The number of dimes is three times the number of nickels. The total value of the collection is $35.00. How many of each coin are there. Solve using system of equations.

25. Simplify: $\frac{(x^2)^3}{(x^2)(x^{-5})}$

26. Simplify: $\left(\frac{3x^4y}{5y^{-1}}\right)^{-2}$

27. Write as an **entire radical**: $5\sqrt[3]{16}$

28. A square has an area of 32 cm^2. What is the **side length** of the square as a **radical in simplest form**?



29. What is the **greatest common factor** of $18x^2y^3$, $30x^3y$, and $8y^4$?

30. Find the **Least Common Multiple** of 54 and 180

31. Expand and simplify: $(x + 5)(x - 4)(2x + 9)$

32. Factor the following: $6x^2 - 19x - 7.$

33. FULLY FACTOR the following: $16x^4 - 1$

34. FULLY FACTOR the following:

$$2x^4 - 2x^2 - 24$$

35. Simplify: $(-125z^6)^{\frac{2}{3}}$

36. Expand and simplify: $(x + 2)(x^2 - 3x + 8)$

37. Factor the following: $x^2 + 3x - 40$

(2 marks)

38. Factor the following: $6x^2 + 19x + 10$

39. FULLY FACTOR the following: $98x^2 - 18$

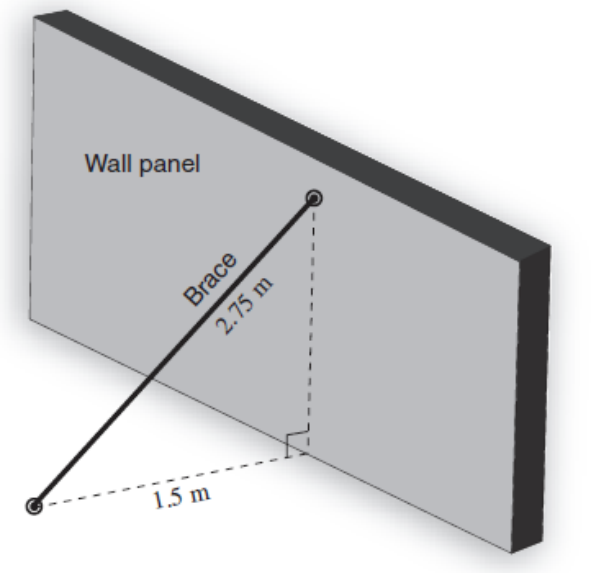
40. State whether the following are relations, functions or one-to-one functions

a. (4, 2) , (3, 0) , (7, 1), (1, 0) relation Y/N, function Y/N, 1-to-1 function Y/N

b. (1, 5) , (2, 9) , (4, 17) , (5, 21) relation Y/N, function Y/N, 1-to-1 function Y/N

c. (5, -2) , (1, 1) , (5, 2) , (1, -1) relation Y/N, function Y/N, 1-to-1 function Y/N

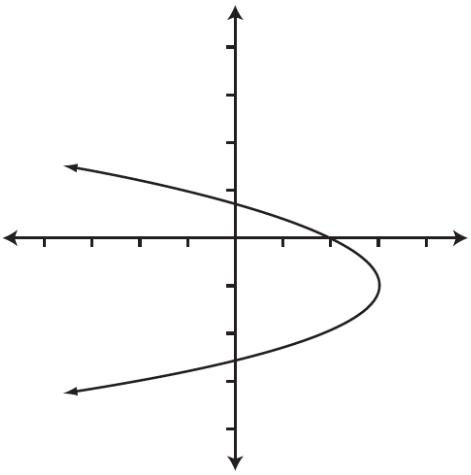
41. This brace is 2.75 m long and must be anchored 1.5m from the base of the wall. **What angle does the brace make with the ground?** *Nearest tenth*



42. In $\triangle TUV$, UV = 8 m, $\angle U = 90°$, and $\angle T = 38°$. Determine the length of UT, to the nearest metre.

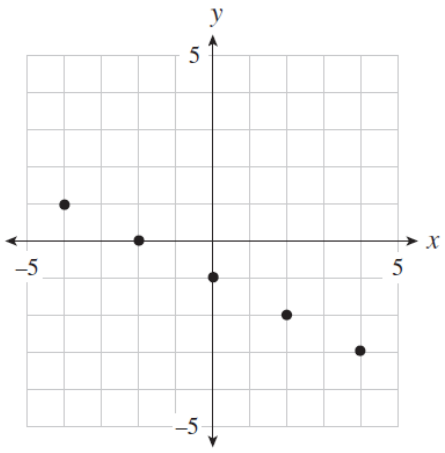
43. Bob is standing on a surveyors mark 25 m from the base of a building. He measures a 61° angle of elevation to the top of the building. How tall is the building to the nearest metre?

44. What is the **domain** and **range** of the following:



Domain:_____ **Range:**_____

Use the following graph to answer question 45



45. **Determine the value of x** if $f(x) = -2$

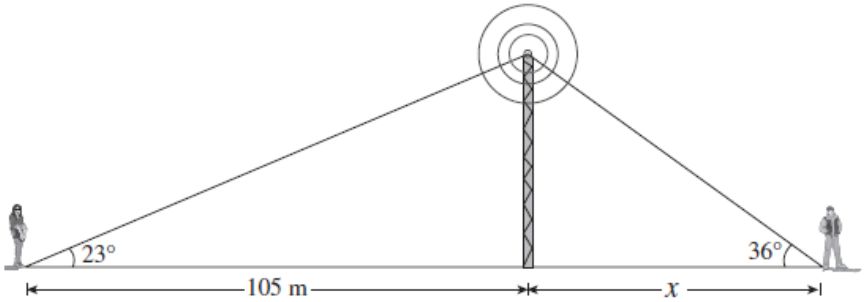
46. The point $(6, k)$ is on a line that has a y-intercept of -2, and is **perpendicular** to the line $y = \frac{2}{3}x + 4$. What is the value of k?

$k =$ _____

47. Carly and Joel buy some Hot Dogs and some Smoothies for their friends at the Saanich Fair. Carly bought 3 Hot Dogs and 4 Smoothies for a total of $33.75. Joel bought 5 Hot Dogs and 2 Smoothies for $35.25. How much did it cost to buy one **Smoothie**?

48. What is $\left(\sqrt[4]{x^3}\right)\left(\sqrt[8]{x^{10}}\right)$ when written as a single power of x?

49. Janelle and Manny are standing on opposite sides of a cell phone tower. Janelle is standing 105m from the tower. Her angle of elevation to the tower is 23°. Manny's angle of elevation to the top of the tower is 36°. What is the **distance from Manny to the <u>base</u> of the tower**? *Answer to one decimal place.*



50. Sketch and **solve** the following triangle ABC: $Angle\ C\ =\ 90°,\ side\ a\ =\ 6.7m,$ $side\ b\ =\ 7.9m$

Answers to one decimal place

Side c = _____
Angle A = _____
Angle B = _____

51. Pete earns an annual salary of $67 300. This year he will receive a 4% bonus. Scott earns $1040/week in wages and an average of $170 in tips per week. **Who earned more gross income this year**, and by how much?

_____ earned more, by $_____

52. Janet's net pay is $1164 for a 35 hour week. Her personal annual taxes are $14 763, CPP is $2564 and EI is $836. What is her **gross** bi-weekly pay? What is her **gross pay per hour**?

Gross Bi-Weekly Pay:_____

Gross Pay Per Hour:_____

53. Determine the amount of **total tax** on Duffy McTaxersson's gross earnings of $94 000. Assume CPP and EI have been paid and they are tax credits.

CPP:

EI:

Total (CPP + EI):

Fed tax:

Fed Tax Credits:

Fed Total Tax:

Prov tax:

Prov Tax Credits:

Prov Total Tax:

Total Tax:

54. A Plumbing company charges a fixed amount, plus an hourly rate for a service call. A two hour service call is $145, and a four hour service call is $255.

a. Write the equation that shows how the total cost, T, depends on the number of hours, h, and the fixed cost, C. Use R for hourly rate.

b. Find the hourly rate.

c. Find the fixed amount cost.

d. Write the equation that now describes this relation, and use it to find the Total Cost of 27 hours of work

Equation:_____

Cost of 27 hours of work:_____

e. Find the **domain** and **range**.