Date: _____ Name: _____

MCF 3M1

Practice: Review of Essential Skills and Knowledge

Complete all questions on a separate piece of paper showing all steps of work and using proper form.

1. Evaluate.

   a. $\frac{1}{-2}+\frac{1}{6}$ b. $\frac{-2}{3}+\left(\frac{-1}{2}-\frac{1}{3}\right)$ c. $\left(\frac{2}{3}\right)^2-\frac{-4}{9}$ d. $\left(\frac{-3}{5}\right)\left(\frac{-10}{21}\right)$

   e. $-3\frac{1}{4}\div\frac{-2}{3}$ f. $\frac{2}{5}\div\left(\frac{-2}{5}+\frac{1}{10}\right)$ g. $-6\div(-3)$ h. $54-(-9)$

   i. $-3+(-12)\div(-3)$ j. $12-(-2)(9)\div 3$ k. $-3+(-2)^2+(-3)^2$ l. $\sqrt{81}-(-5)(2)$

2. Evaluate the expression $3a-4b$ for each of the following values of the variable.

   a. $a=3$ and $b=2$ b. $a=-1$ and $b=5$ c. $a=-1/4$ and $b=2/3$ d. $a=5/2$ and $b=-4/3$

3. Solve each of the following equations and verify your answer.

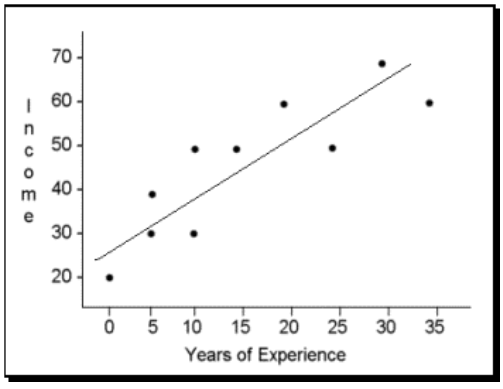
   a. $7x-5=9$ b. $2y+3=17$ c. $-1=\frac{-2k-7}{3}$ d. $-9+2a=6a+7$

4. The table shows the cost, *C*, in dollars, to rent a car for a day and drive a distance, *d*, in kilometres.

Distance, *d* (km)	**Cost, *C* ($)**
0	50
100	65
200	80
300	95
400	110

   a. What is the fixed cost?
   b. What is the variable cost? Explain how you found this.
   c. Write an equation relating *C* and *d*.
   d. What is the cost of renting a car for a day and driving 750 km?

5. Describe the relationship that exists between a person's income and years of experience.



6. State an equivalent ratio for each of the following.
   a. 5 : 15 b. 12 : 3

7. Find the missing term in each of the following.
   a. $\frac{3}{8}=\frac{n}{56}$ b. $\frac{x}{132}=\frac{5}{6}$

8. Find the total cost of an item discounted at 20% of its regular selling price of $189.98 and taxed at 13%.

9. The Hughes family drove 205 km in 2.5 hours. How far did they drive per hour?

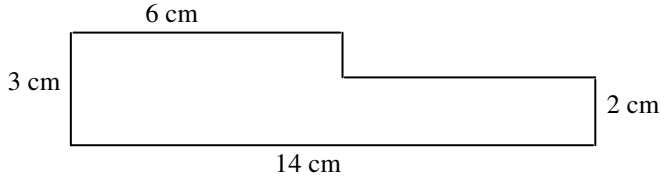
10. Simplify each of the following expressions.
   a. $4c-2+c-6$ b. $x^2-3x+2x^2+5x+6$ c. $\frac{1}{2}x^2-\frac{2}{3}x-\frac{3}{4}x^2+\frac{1}{9}x$
   d. $-6(4x-1)+x(x-3)$ e. $-(x^2+2x-1)+(5x^2-8x+4)$ f. $(2x-1)(8x+3)$

11. Given the relations $3x+y-5=0$ and $x^2-y-2=0$,
   a. state which relation is linear
   b. rewrite the equation in slope/*y*-intercept form
   c. state the slope of the linear relation
   d. state the *y*-intercept of the linear relation

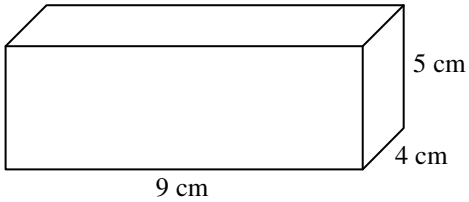
12. An online music download site offers two monthly plans:
   Plan A: $10 plus $1 per download
   Plan B: $1.50 per download
   a. Graph this linear system to determine when both plans cost the same.
   b. Explain the conditions under which each plan is better.

13. Use the Pythagorean Theorem to determine the hypotenuse of a right triangle if the other two sides measure 5 cm and 8 cm. Round answer to 1 decimal place.

14. Find the perimeter and area of the shape below.



15. Find the surface area and volume of the rectangular prism.



16. A triangle has two angles measuring 62° and 44°, determine the measure of the third angle.

17. On a sunny day, Albert, who is 1.85 m tall, casts a shadow 0.76 m long. At the same time, a nearby flagpole casts a shadow 14.2 m long. How tall is the flagpole to the nearest tenth of a metre? Include a diagram with your answer.

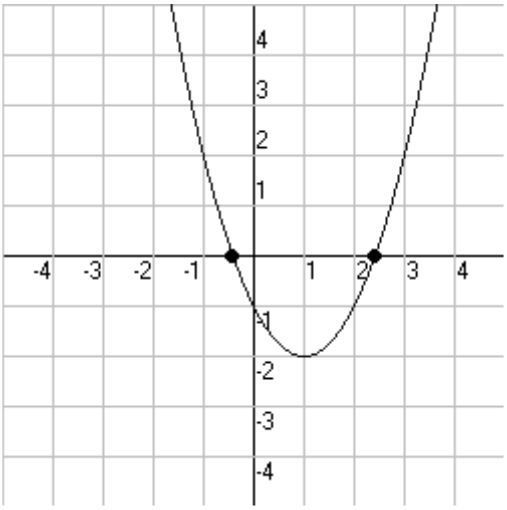
18. A ramp is being built to roll barrels onto a platform. the platform is 6 ft high and the angle of the ramp is to be 30° from the horizontal. How long will the ramp be? Include a diagram with your answer.

19. A 10 ft extension ladder is positioned to reach 7.4 ft up a wall. How far away from the base of the wall is the ladder? Include a diagram with your answer.

20. Find the equation of the line passing through the points A(3, 2) and B(6, 3).

21. Factor.
    a. $6x^2y - 42xy^2$ b. $x^2 - 10x + 16$ c. $x^2 - 36$

22. For the graph, identify



    a. the coordinates of the vertex
    b. the equation of the axis of symmetry
    c. the *x*- and *y*-intercepts
    d. the minimum or maximum value
    e. the equation