

Date: _____

Name: _____

MPM 2DI – Exam Review Problem Set #1

1. Simplify:

a) $(3xy^2)(-4x^3y^2)$ b) $\frac{45x^4y^3z^2}{-5x^2z^3}$ c) $7x + 10 - 2(x + 3)$
d) $(x + 5)(x - 8)$ e) $(2x - 3)^2$ f) $3(2x - 1)(2x + 1)$

2. Factor, if possible:

a) $5m^2n - 20m + 10n^2$ b) $x^2 - 8x + 15$ c) $3x^2 + 12xy - 36y^2$
d) $2x(m + n) - (m + n)$ e) $4x^2 + 6x + 2$ f) $3x^2 - 27$

3. For each of the following sets of points, determine: (i) slope of the line segment
(ii) length of the line segment
(iii) midpoint of the line segment

a) (6, 3) and (-4, 7) b) (-5, 8) and (3, -6)

4. Determine the equation of a circle with centre (0, 0), given:

a) radius = 4 b) point (-2, 9) is on the circumference

5. Determine the equation of the following lines:

a) line through the points (2, 5) and (3, -4)
b) vertical line through the point (5, 6)
c) the line parallel to $y = 2x - 7$ and passing through the point (2, -6)
d) the line perpendicular to $3x + y - 8 = 0$ with the same y-intercept as $4x - 3y + 12 = 0$

6. Solve the following linear systems:

a) $4x + 3y = 7$ b) $7a + 3b = 47$ c) $5x - 2y = 66$
 $3x + y = -1$ $2a + 5b = 30$ $\frac{x}{6} + \frac{y}{4} = 6$

7. A plane makes a trip of 5040 km in 7 h, flying with the wind. Returning against the wind, the plane makes the trip in 9 h. What is the speed of the wind and the speed of the plane in still air?

8. In hockey, a team receives 2 points for a win and 1 point for a tie. During a hockey season of 60 games, the Rockets lost 28 games but earned 51 points. How many games did the team win?