

Name: _____ Class/Period: _____ Attempt # _____ Date: 01/20/2012 ID: N

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Date: 01/20/2012 ID: N

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: **Perfect** **Sufficient** **Insufficient (Repeat Evaluation)**

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

- Determine the distance between the points P(1, 7) and Q(-4, 2). Give an **exact answer** and an **approximate answer** rounded to two decimal places.
 - Determine the coordinates of the **midpoint** of the line segment with the following endpoints.
A(-1, 14) and B(7, 18)
 - Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (-45, -28).
 - Determine the equation of the line that is **perpendicular to** $y = \frac{1}{5}x + 8$ and passes through the point P(-5, -9).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

1. $d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$

$$d = \sqrt{((-4) - (1))^2 + ((2) - (7))^2}$$

$$d = \sqrt{(-5)^2 + (-5)^2}$$

$$d = \sqrt{50} \quad \text{exact answer}$$

$$d \approx 7.07 \quad \text{approximate answer}$$

2. $M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(-1) + (7)}{2}, \frac{(14) + (18)}{2}\right)$

$$= M\left(\frac{6}{2}, \frac{32}{2}\right)$$

$$= M(3, 16)$$

3. $r^2 = (-45)^2 + (-28)^2$ Equation: $x^2 + y^2 = 2809$ radius = 53

$$r^2 = 2809$$

$$r = \pm \sqrt{2809} \quad \text{but } r > 0$$

$$\therefore r = 53$$

4. perpendicular slope: $m = -5$

equation is: $y = -5x + b$

sub P(-5, -9): $-9 = -5(-5) + b$

$$34 = b$$

$$b = 34$$

perpendicular equation: $y = -5x - 34$

Name: _____ Class/Period: _____ Attempt #: _____ Date: 01/20/2012 ID: O

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: Perfect Sufficient Insufficient (Repeat Evaluation)

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

1. Determine the distance between the points P(-9, 4) and Q(-8, 10). Give an **exact answer** and an **approximate answer** rounded to two decimal places.

2. Determine the coordinates of the **midpoint** of the line segment with the following endpoints.

A(-2, -9) and B(14, -13)

3. Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (24, -18).

4. Determine the equation of the line that is **perpendicular to** $y = \frac{1}{3}x + 10$ and passes through the point P(11, -15).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

$$1. \quad d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$$

$$d = \sqrt{((-8) - (-9))^2 + ((10) - (4))^2}$$

$$d = \sqrt{(1)^2 + (6)^2}$$

$$d = \sqrt{37} \quad \text{exact answer}$$

$$d \approx 6.08 \quad \text{approximate answer}$$

$$2. \quad M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(-2) + (14)}{2}, \frac{(-9) + (-13)}{2}\right)$$

$$= M\left(\frac{12}{2}, \frac{-22}{2}\right)$$

$$= M(6, -11)$$

$$3. \quad r^2 = (24)^2 + (-18)^2 \quad \text{Equation: } x^2 + y^2 = 900 \quad \text{radius} = 30$$

$$r^2 = 900$$

$$r = \pm\sqrt{900} \quad \text{but } r > 0$$

$$\therefore r = 30$$

$$4. \quad \text{perpendicular slope: } m = -3$$

$$\text{equation is: } y = -3x + b$$

$$\text{sub P}(11, -15): \quad -15 = -3(11) + b$$

$$18 = b$$

$$b = 18$$

$$\text{perpendicular equation: } y = -3x + 18$$

Name: _____ Class/Period: _____ Attempt #: _____ Date: 01/20/2012 ID: P

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: Perfect Sufficient Insufficient (Repeat Evaluation)

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

1. Determine the distance between the points P(-8, -6) and Q(-3, 2). Give an **exact answer** and an **approximate answer** rounded to two decimal places.

2. Determine the coordinates of the **midpoint** of the line segment with the following endpoints.

A(-12, 16) and B(-4, -14)

3. Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (18, 24).

4. Determine the equation of the line that is **perpendicular to** $y = \frac{1}{4}x + 6$ and passes through the point P(8, -2).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

$$1. \quad d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$$

$$d = \sqrt{((-3) - (-8))^2 + ((2) - (-6))^2}$$

$$d = \sqrt{(5)^2 + (8)^2}$$

$$d = \sqrt{89} \quad \text{exact answer}$$

$$d \approx 9.43 \quad \text{approximate answer}$$

$$2. \quad M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(-12) + (-4)}{2}, \frac{(16) + (-14)}{2}\right)$$

$$= M\left(\frac{-16}{2}, \frac{2}{2}\right)$$

$$= M(-8, 1)$$

$$3. \quad r^2 = (18)^2 + (24)^2 \quad \text{Equation: } x^2 + y^2 = 900 \quad \text{radius} = 30$$

$$r^2 = 900$$

$$r = \pm\sqrt{900} \quad \text{but } r > 0$$

$$\therefore r = 30$$

$$4. \quad \text{perpendicular slope: } m = -4$$

$$\text{equation is: } y = -4x + b$$

$$\text{sub } P(8, -2): \quad -2 = -4(8) + b$$

$$30 = b$$

$$b = 30$$

$$\text{perpendicular equation: } y = -4x + 30$$

Name: _____ Class/Period: _____ Attempt #: _____ Date: 01/20/2012 ID: Q

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: Perfect Sufficient Insufficient (Repeat Evaluation)

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

1. Determine the distance between the points P(-4, 1) and Q(-6, 5). Give an **exact answer** and an **approximate answer** rounded to two decimal places.
2. Determine the coordinates of the **midpoint** of the line segment with the following endpoints.
A(-4, 6) and B(-2, 8)
3. Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (-3, -4).
4. Determine the equation of the line that is **perpendicular to** $y = \frac{1}{4}x - 8$ and passes through the point P(-11, 20).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

$$1. \quad d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$$

$$d = \sqrt{((-6) - (-4))^2 + ((5) - (1))^2}$$

$$d = \sqrt{(-2)^2 + (4)^2}$$

$$d = \sqrt{20} \quad \text{exact answer}$$

$$d \approx 4.47 \quad \text{approximate answer}$$

$$2. \quad M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(-4) + (-2)}{2}, \frac{(6) + (8)}{2}\right)$$

$$= M\left(\frac{-6}{2}, \frac{14}{2}\right)$$

$$= M(-3, 7)$$

$$3. \quad r^2 = (-3)^2 + (-4)^2 \quad \text{Equation: } x^2 + y^2 = 25 \quad \text{radius} = 5$$

$$r^2 = 25$$

$$r = \pm \sqrt{25} \quad \text{but } r > 0$$

$$\therefore r = 5$$

$$4. \quad \text{perpendicular slope: } m = -4$$

$$\text{equation is: } y = -4x + b$$

$$\text{sub P}(-11, 20): \quad 20 = -4(-11) + b$$

$$24 = b$$

$$b = 24$$

$$\text{perpendicular equation: } y = -4x - 24$$

Name: _____ Class/Period: _____ Attempt #: _____ Date: 01/20/2012 ID: R

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: Perfect Sufficient Insufficient (Repeat Evaluation)

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

1. Determine the distance between the points P(-3, -10) and Q(-7, -4). Give an **exact answer** and an **approximate answer** rounded to two decimal places.

2. Determine the coordinates of the **midpoint** of the line segment with the following endpoints.

A(-4, -19) and B(-16, -7)

3. Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (-36, 15).

4. Determine the equation of the line that is **perpendicular to** $y = -\frac{1}{3}x + 3$ and passes through the point P(1, 18).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

$$1. \quad d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$$

$$d = \sqrt{((-7) - (-3))^2 + ((-4) - (-10))^2}$$

$$d = \sqrt{(-4)^2 + (6)^2}$$

$$d = \sqrt{52} \quad \text{exact answer}$$

$$d \approx 7.21 \quad \text{approximate answer}$$

$$2. \quad M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(-4) + (-16)}{2}, \frac{(-19) + (-7)}{2}\right)$$

$$= M\left(\frac{-20}{2}, \frac{-26}{2}\right)$$

$$= M(-10, -13)$$

$$3. \quad r^2 = (-36)^2 + (15)^2 \quad \text{Equation: } x^2 + y^2 = 1521 \quad \text{radius} = 39$$

$$r^2 = 1521$$

$$r = \pm \sqrt{1521} \quad \text{but } r > 0$$

$$\therefore r = 39$$

$$4. \quad \text{perpendicular slope: } m = 3$$

$$\begin{array}{ll} \text{equation is:} & y = 3x + b \\ \text{sub P(1, 18):} & 18 = 3(1) + b \\ & 15 = b \\ & b = 15 \end{array}$$

$$\text{perpendicular equation: } y = 3x + 15$$

Name: _____ Class/Period: _____ Attempt #: _____ Date: 01/20/2012 ID: S

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: Perfect Sufficient Insufficient (Repeat Evaluation)

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

1. Determine the distance between the points P(-7, -1) and Q(-6, -6). Give an **exact answer** and an **approximate answer** rounded to two decimal places.

2. Determine the coordinates of the **midpoint** of the line segment with the following endpoints.

A(12, 12) and B(10, -14)

3. Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (-12, -35).

4. Determine the equation of the line that is **perpendicular to** $y = -\frac{1}{4}x - 6$ and passes through the point P(-20, 20).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

$$1. \quad d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$$

$$d = \sqrt{((-6) - (-7))^2 + ((-6) - (-1))^2}$$

$$d = \sqrt{(1)^2 + (-5)^2}$$

$$d = \sqrt{26} \quad \text{exact answer}$$

$$d \approx 5.1 \quad \text{approximate answer}$$

$$2. \quad M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(12) + (10)}{2}, \frac{(12) + (-14)}{2}\right)$$

$$= M\left(\frac{22}{2}, \frac{-2}{2}\right)$$

$$= M(11, -1)$$

$$3. \quad r^2 = (-12)^2 + (-35)^2 \quad \text{Equation: } x^2 + y^2 = 1369 \quad \text{radius} = 37$$

$$r^2 = 1369$$

$$r = \pm \sqrt{1369} \quad \text{but } r > 0$$

$$\therefore r = 37$$

$$4. \quad \text{perpendicular slope: } m = 4$$

$$\text{equation is: } y = 4x + b$$

$$\text{sub P}(-20, 20): \quad 20 = 4(-20) + b$$

$$100 = b$$

$$b = 100$$

$$\text{perpendicular equation: } y = 4x + 100$$

Name: _____ Class/Period: _____ Attempt #: _____ Date: 01/20/2012 ID: T

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: Perfect Sufficient Insufficient (Repeat Evaluation)

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

1. Determine the distance between the points P(10, -1) and Q(9, 3). Give an **exact answer** and an **approximate answer** rounded to two decimal places.

2. Determine the coordinates of the **midpoint** of the line segment with the following endpoints.

A(3, -3) and B(1, -17)

3. Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (-24, -45).

4. Determine the equation of the line that is **perpendicular to** $y = -\frac{1}{2}x - 2$ and passes through the point P(-3, 2).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

$$1. \quad d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$$

$$d = \sqrt{(9 - 10)^2 + (3 - (-1))^2}$$

$$d = \sqrt{(-1)^2 + (4)^2}$$

$$d = \sqrt{17} \quad \text{exact answer}$$

$$d \approx 4.12 \quad \text{approximate answer}$$

$$2. \quad M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(3) + (1)}{2}, \frac{(-3) + (-17)}{2}\right)$$

$$= M\left(\frac{4}{2}, \frac{-20}{2}\right)$$

$$= M(2, -10)$$

$$3. \quad r^2 = (-24)^2 + (-45)^2 \quad \text{Equation: } x^2 + y^2 = 2601 \quad \text{radius} = 51$$

$$r^2 = 2601$$

$$r = \pm \sqrt{2601} \quad \text{but } r > 0$$

$$\therefore r = 51$$

$$4. \quad \text{perpendicular slope: } m = 2$$

$$\text{equation is: } y = 2x + b$$

$$\text{sub P}(-3, 2): \quad 2 = 2(-3) + b$$

$$8 = b$$

$$b = 8$$

$$\text{perpendicular equation: } y = 2x + 8$$

Name: _____ Class/Period: _____ Attempt #: _____ Date: 01/20/2012 ID: U

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: Perfect Sufficient Insufficient (Repeat Evaluation)

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

1. Determine the distance between the points P(-7, 10) and Q(-5, 4). Give an **exact answer** and an **approximate answer** rounded to two decimal places.

2. Determine the coordinates of the **midpoint** of the line segment with the following endpoints.

A(3, 14) and B(1, 10)

3. Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (-45, -28).

4. Determine the equation of the line that is **perpendicular to** $y = -\frac{1}{3}x + 5$ and passes through the point P(-5, -12).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

$$1. \quad d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$$

$$d = \sqrt{((-5) - (-7))^2 + ((4) - (10))^2}$$

$$d = \sqrt{(2)^2 + (-6)^2}$$

$$d = \sqrt{40} \quad \text{exact answer}$$

$$d \approx 6.32 \quad \text{approximate answer}$$

$$2. \quad M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(3) + (1)}{2}, \frac{(14) + (10)}{2}\right)$$

$$= M\left(\frac{4}{2}, \frac{24}{2}\right)$$

$$= M(2, 12)$$

$$3. \quad r^2 = (-45)^2 + (-28)^2 \quad \text{Equation: } x^2 + y^2 = 2809 \quad \text{radius} = 53$$

$$r^2 = 2809$$

$$r = \pm \sqrt{2809} \quad \text{but } r > 0$$

$$\therefore r = 53$$

$$4. \quad \text{perpendicular slope: } m = 3$$

$$\text{equation is: } y = 3x + b$$

$$\text{sub P}(-5, -12): \quad -12 = 3(-5) + b$$

$$3 = b$$

$$b = 3$$

$$\text{perpendicular equation: } y = 3x + 3$$

Name: _____ Class/Period: _____ Attempt #: _____ Date: 01/20/2012 ID: V

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: Perfect Sufficient Insufficient (Repeat Evaluation)

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

1. Determine the distance between the points P(2, -1) and Q(-3, 4). Give an **exact answer** and an **approximate answer** rounded to two decimal places.
2. Determine the coordinates of the **midpoint** of the line segment with the following endpoints.
A(11, 20) and B(15, 18)
3. Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (28, -21).
4. Determine the equation of the line that is **perpendicular to** $y = \frac{1}{4}x + 2$ and passes through the point P(14, -9).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

$$1. \quad d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$$

$$d = \sqrt{((-3) - (2))^2 + ((4) - (-1))^2}$$

$$d = \sqrt{(-5)^2 + (5)^2}$$

$d = \sqrt{50}$ exact answer

$d \approx 7.07$ approximate answer

$$2. \quad M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(11) + (15)}{2}, \frac{(20) + (18)}{2}\right)$$

$$= M\left(\frac{26}{2}, \frac{38}{2}\right)$$

$$= M(13, 19)$$

$$3. \quad r^2 = (28)^2 + (-21)^2 \quad \text{Equation: } x^2 + y^2 = 1225 \quad \text{radius} = 35$$

$$r^2 = 1225$$

$$r = \pm \sqrt{1225} \quad \text{but } r > 0$$

$$\therefore r = 35$$

$$4. \quad \text{perpendicular slope: } m = -4$$

$$\text{equation is: } y = -4x + b$$

$$\text{sub P}(14, -9): \quad -9 = -4(14) + b$$

$$47 = b$$

$$b = 47$$

$$\text{perpendicular equation: } y = -4x + 47$$

Name: _____ Class/Period: _____ Attempt #: _____ Date: 01/20/2012 ID: W

$$M = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x^2 + y^2 = r^2$$

Proficiency Demonstrated: Perfect Sufficient Insufficient (Repeat Evaluation)

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry

1. Determine the distance between the points P(4, 10) and Q(7, 4). Give an **exact answer** and an **approximate answer** rounded to two decimal places.

2. Determine the coordinates of the **midpoint** of the line segment with the following endpoints.

A(14, -17) and B(-16, 13)

3. Determine the **equation** and the **radius** of a circle centred at (0, 0) and passing through (24, 10).

4. Determine the equation of the line that is **perpendicular to** $y = \frac{1}{2}x + 10$ and passes through the point P(16, 5).

MPM2D - Essential Skills Proficiency Assessment # 2 - Coordinate Geometry
Answer Section

1. $d = \sqrt{(x_Q - x_P)^2 + (y_Q - y_P)^2}$

$$d = \sqrt{(7 - 4)^2 + (4 - 10)^2}$$

$$d = \sqrt{3^2 + (-6)^2}$$

$$d = \sqrt{45} \quad \text{exact answer}$$

$$d \approx 6.71 \quad \text{approximate answer}$$

2. $M\left(\frac{x_A + x_B}{2}, \frac{y_A + y_B}{2}\right) = M\left(\frac{(14) + (-16)}{2}, \frac{(-17) + (13)}{2}\right)$

$$= M\left(\frac{-2}{2}, \frac{-4}{2}\right)$$

$$= M(-1, -2)$$

3. $r^2 = (24)^2 + (10)^2$ Equation: $x^2 + y^2 = 676$ radius = 26

$$r^2 = 676$$

$$r = \pm\sqrt{676} \quad \text{but } r > 0$$

$$\therefore r = 26$$

4. perpendicular slope: $m = -2$

equation is: $y = -2x + b$

sub P(16, 5): $5 = -2(16) + b$

$$37 = b$$

$$b = 37$$

perpendicular equation: $y = -2x + 37$