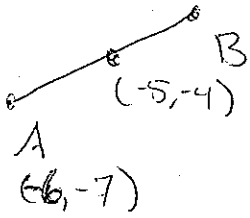
Quiz 5

Name: Key

Show *all* your work algebraically for each and simplify. No credit is given without supporting work.

1. [3] (WebHW10 #5) The midpoint of a line segment AB is (-5,-4). If $A = (-6, -7)$, find B.



understood/picture (+1)

$\frac{x-6}{2} = -5$ $\qquad$ $\frac{y-7}{2} = -4$ $\qquad$ midpoint formula (+1.5)

$x - 6 = -10$ $\qquad$ $y - 7 = -8$ $\qquad$ plugged in (+1.5)

$x = -4$ $\qquad$ $y = -1$

(+1.5) $\qquad$ (+1.5)

2. [2] (§4.1 #29) Find the radius of a circle that has circumference 12 more than its diameter.

diameter + 12 = circumference (+1) $\qquad$ Let r be the radius

$2r + 12 = 2\pi r$ $\qquad$ pestal +.5

$12 = 2\pi r - 2r$

$12 = r(2\pi - 2)$ $\qquad$ alg (+1.5) $\qquad$ goal (+1.5)

$2.8017 \approx \frac{12}{2\pi - 2} = r$

3. (§4.1 #31,32 WebHWW10 #8-11) The equation $x^2 - 6x + y^2 + 1 = 0$ describes a circel in the $x - y$ plane.

(a) [2] Complete the square to write the above equation in the form

$$(x-h)^2 + (y-k)^2 = r^2$$

$x^2 - 6x + \left(\frac{6}{2}\right)^2 - \left(\frac{6}{2}\right)^2 + y^2 + 1 = 0$

$(x^2 - 3)^2 - 9 + y^2 + 1 = 0$

$(x^2 - 3)^2 + y^2 - 8 = 0$

$(x^2 - 3)^2 + y^2 = 8$

$(x^2 - 3)^2 + y^2 = (\sqrt{8})^2$

added $\left(\frac{b}{2}\right)^2$ +.5 kept balanced +.5 factored/alg +.5 involved +.5

(b) [2] Find the center of the circle.

center $(3, 0)$ +1 +1

(c) [1] What is the diameter of the circle?

radius $\sqrt{8} = 2\sqrt{2}$ +.5

diameter is $4\sqrt{2}$ +.5

≈ 5.66