College Algebra | HW #2 | Due 03/05/11

Spring 2011 | Dr. D. P. Story

In preparation for the quiz on Thursday, solve each of these short problems in the space provided before looking at their solutions at the end of the document.

`http://faculty.nwfsc.edu/web/math/storyd`

All class assignments and other announcements will be posted on this web site.

1. Let $P(-4, 2)$ and $Q(2, -3)$ be two points in the plane.

(a) Find the distance $d(P, Q)$ between P and Q.

(b) Find the midpoint M between P and Q.

2. Complete each of the two sentences below with correct entries.

(a) The function $g(x) = |x + 2|$ can be graphed from the library function $f(x) = |x|$ by shifting it ____ units _____ (horizontally/vertically) _____ (left/right/up/down).

(b) The function $g(x) = 5 - x^2$ can be graphed from the library function $f(x) = x^2$ by first reflecting it with respect to the ____ axis, then shifting it ____ units _____ (horizontally/vertically) _____ (left/right/up/down).

3. The circle $x^2 + y^2 = 25$ passes through the point $P(3, 4)$. Let ℓ be the line passing though the origin and the point P. Find the equation of the line perpendicular to line ℓ and passing through point P.

4. If the slope the a line is negative, then the line is

☐ increasing ☐ decreasing ☐ constant ☐ none of these

Solutions to HW #2

1. (a) We use the distance formula

$$d(P,Q) = \sqrt{(2+4)^2 + (-3-2)^2} = \sqrt{61}$$

to obtained the required answer.

1. (b) We use the midpoint formula

$$M = \left(\frac{-4+2}{2}, \frac{2+(-3)}{2}\right) = \left(-1, -\frac{1}{2}\right)$$

to obtained the required answer.

2. (a) The function $g(x) = |x+2|$ can be graphed from the library function $f(x) = |x|$ by shifting it __2__ units ____horizontally____ (horizontally/vertically) ____left____ (left/right/up/down).

2. (b) The function $g(x) = 5 - x^2$ can be graphed from the library function $f(x) = x^2$ by first reflecting it with respect to the __x__ axis, then shifting it __5__ units ____vertically____ (horizontally/vertically) __upward__ (left/right/up/down).

3. The slope of the line perpendicular to ℓ is $m = -\frac{3}{4}$, the line must pass through $(3,4)$; thus, the line is $y - 4 = -\frac{3}{4}(x-3) \implies y = -\frac{3}{4}x + \frac{25}{4}$. Thus,

Ans: $\boxed{y = -\frac{3}{4}x + \frac{25}{4}}$

This is the equation of the line tangent to the circle at $P(3,4)$.

4. If the slope the a line is negative, then the line is

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