Name:_____
MA131/135: College Algebra (Spring 2017)
Instructor: Justin Ryan
Midterm Exam 1—Sections 1.1–1.5, and 2.1–2.3

Butler Community College

Read and follow all instructions.

Part I: True or False [2 points each]
Read each statement carefully. In the space provided, write **T** *if the statement is always true, or* **F** *otherwise.*

_____**1.** The lines $y = 3x - 5$ and $6x - 2y = 12$ are parallel.

_____**2.** Every line crosses the y-axis in exactly one point.

_____**3.** The graph of $y = x^2 - 4x + 4$ is obtained by shifting the graph of $y = x^2$ left 2 units.

_____**4.** The distance between the points $(-3, 4)$ and $(3, -4)$ is 10 units.

_____**5.** The circle defined by $x^2 + y^2 = 25$ has center $(0, 0)$ and radius 25.

Part II: Fill in the Blank [2 points each]
Choose the appropriate word or phrase from the word bank, and write its corresponding letter in the space provided.

Word Bank:

A. Point-Slope	**B.** Parallel	**C.** Right
D. Perpendicular	**E.** x-axis	**F.** y-axis
G. Down	**H.** Left	**I.** Slope-Intercept
J. Standard	**K.** Rotational	**L.** Up

_____**6.** The graph of $y = \sqrt{-x}$ is obtained from the graph of $y = \sqrt{x}$ by reflecting over the _____ .

_____**7.** The graph of the function $y = -4x^5 + 16x^3 - 8x$ has _____ symmetry.

_____**8.** "$Ax + By = C$," $A \geq 0$, is called the _____ form of the equation of a line.

_____**9.** The graph of $(x - 1)^2 + y^2 = 1$ is obtained from the graph of $x^2 + y^2 = 1$ by shifting _____ 1 unit.

_____**10.** The lines $3x + y = 2$ and $x - 3y = 2$ are _____ .

Part III: Multiple Choice [5 points each]
Write the letter corresponding to the appropriate answer in the space provided.

_____**11.** Complete the square: $2x^2 - 4x + 6$

A. $2(x-1)^2 + 2$ **B.** $2(x-1)^2 + 4$

C. $2(x+1)^2 + 4$ **D.** $(2x-1)^2 + 4$

_____**12.** What is the center of the circle $(x-3)^2 + (y+6)^2 = 36$?

A. $(3, 6)$ **B.** $(-3, 6)$

C. $(3, -6)$ **D.** $(0, 0)$

_____**13.** What is the radius of the circle $(x-3)^2 + (y+6)^2 = 36$?

A. 36 **B.** 6

C. $\sqrt{6}$ **D.** 1296

_____**14.** Find the midpoint of the line segment connecting the points $(2, -1)$ and $(-6, 5)$.

A. $(-2, 2)$ **B.** $(4, -3)$

C. $(-4, 3)$ **D.** $(2, -2)$

_____**15.** Find the distance between the points $(7, 12)$ and $(4, 16)$.

A. 5 **B.** 25

C. $\sqrt{5}$ **D.** 525

_____**16.** Find the equation of the line passing through the points $(0, 3)$ and $(-2, 1)$.

A. $y = 3x + 1$ **B.** $y = x - 3$

C. $y = x + 3$ **D.** $y = x + 1$

_____**17.** Find an equation of the line passing through the points $(5, 5)$ and $(3, 9)$.

A. $y = -2x + 15$ **B.** $y = -2x - 5$

C. $y = 2x + 4$ **D.** $y = 2x - 15$

_____**18.** Find an equation of the circle with center $(2, -1)$ and passing through the point $(-1, 3)$.

A. $(x + 1)^2 + (y - 3)^2 = 25$ **B.** $(x + 2)^2 + (y - 1)^2 = 25$

C. $(x - 2)^2 + (y + 1)^2 = 5$ **D.** $(x - 2)^2 + (y + 1)^2 = 25$

_____**19.** Find the x-intercept of the line $5x - 10y = 15$.

A. $(-\frac{3}{2}, 0)$ **B.** $(0, 3)$

C. $(0, -\frac{3}{2})$ **D.** $(3, 0)$

_____**20.** Find the y-intercept of the line $5x - 10y = 15$.

A. $(-\frac{3}{2}, 0)$ **B.** $(0, 3)$

C. $(0, -\frac{3}{2})$ **D.** $(3, 0)$

_____**21.** The function $f(x) = -|x + 7| - 12$ is obtained from its parent graph by each of the following transformations **except**:

A. Reflection over the x-axis **B.** Shift left 7 units

C. Reflection over the y-axis **D.** Shift down 12 units

_____**22.** Determine whether the equation $x^2 + 4x + y^2 - 8y = 5$ defines a circle. If so, give its center and radius

A. $C(2, -4)$, $r = 5$ **B.** $C(-2, 4)$, $r = 5$

C. $C(-4, 8)$, $r = 25$ **D.** Not a circle

_____**23.** The graph of $y = \sqrt{x}$ is reflected over the x-axis, stretched vertically by a factor of three, then shifted left 7 and up 5 units. Give an equation of the function defined by the resulting graph.

A. $f(x) = -\sqrt{3x - 7} - 5$

B. $f(x) = 3\sqrt{-x + 7} + 5$

C. $f(x) = -3\sqrt{x + 7} + 5$

D. $f(x) = -3\sqrt{x - 7} + 5$

_____**24.** The function $f(x) = \dfrac{3x^7 - 5x^3}{2x^2 + x^4}$ is ...

A. even

B. odd

C. neither

D. I don't know, dude

Part IV: Short Answer [5 points each]
Show enough work. Clearly mark your final answers. Partial credit given when deserved.

25. Describe how the graph of $y = x^2 + 12x + 32$ is obtained from the graph of the parent function.

26. Use the graph to: *a.*) identify the parent function; *b.*) list all transformations; *c.*) write an equation of the function.