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

Read and follow all instructions.

Part I: True or False [5 points each]
Read each statement carefully. In the space provided, write **T** *if the statement is always true, or* **F** *otherwise.*

_____**1.** Two lines are perpendicular if their slopes are reciprocals of one another.

_____**2.** The line $5x + 10y = 8$ has a slope of $-\frac{1}{2}$.

_____**3.** The vertex of $y = x^2 + 2x - 1$ is $(-1, -2)$.

_____**4.** The lines $y = 2x - 5$ and $4x - 2y = 12$ are parallel.

Part II: Fill in the Blank [5 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.** Reflection	**C.** Right
D. Skew	**E.** x-axis	**F.** y-axis
G. Down	**H.** Left	**I.** Slope-Intercept
J. Standard	**K.** Rotational	**L.** Up

_____**5.** The graph of the function $f(x) = 13x^4 - 5x^2 + 7$ has _____ symmetry.

_____**6.** "$y - y_1 = m(x - x_1)$" is called the _____ form of the equation of a line.

_____**7.** The graph of the function $f(x) = (x + 3)^3$ is obtained by shifting the graph of the parent function _____ 3 units.

_____**8.** If a function f is odd, then its graph has _____ symmetry.

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

_____**9.** Find an equation of the line passing through the points $P(2, 4)$ and $Q(-2, 6)$.

A. $y = -2x + 8$ **B.** $y = 2x$

C. $y = -\frac{1}{2}x + 5$ **D.** $y = -\frac{1}{2}x + 3$

_____**10.** The graph of $y = \sqrt{x}$ is reflected over the y-axis, then stretched vertically by a factor of 2, then shifted down 3 units and left 1 unit. Give an equation of the function defined by the resulting graph.

A. $f(x) = -\sqrt{2x + 2} - 3$ **B.** $f(x) = -2\sqrt{x + 1} - 3$

C. $f(x) = 2\sqrt{-x - 3} - 1$ **D.** $f(x) = 2\sqrt{-x - 1} - 3$

_____**11.** Find the distance between the points $P(14, 10)$ and $Q(8, 18)$.

A. 10 **B.** 100

C. $\sqrt{28}$ **D.** $(11, 14)$

_____**12.** On what interval is the function $f(x) = (x + 5)^2 - 2$ increasing?

A. $(-5, \infty)$ **B.** $(-\infty, -5)$

C. $(-\infty, -2)$ **D.** $(-2, -\infty)$

_____**13.** What type of discontinuity, if any, does the function $f(x) = \dfrac{x^3+1}{x+1}$ have at the point $x = -1$?

A. hole **B.** jump

C. vertical asymptote **D.** none

_____**14.** What is the domain of the function $f(x) = \dfrac{1}{\sqrt{x-2}}$?

A. $(-\infty, 2]$ **B.** $[2, \infty)$

C. $(2, \infty)$ **D.** $(-\infty, 2)$

_____**15.** Describe how the graph of $y = (x+5)^3 + 2$ is obtained from the graph of the parent function.

A. shift left 5, down 2 **B.** shift right 5, up 2

C. shift right 5, down 2 **D.** shift left 5, up 2

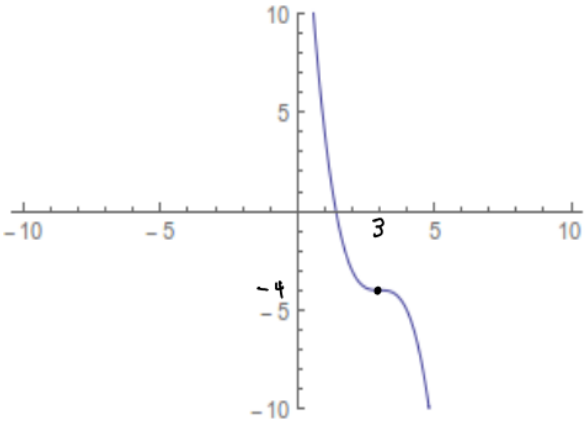
_____**16.** The function $f(x) = \dfrac{x^3 - x}{2x^5 - 3x}$ is...

A. even **B.** odd

C. neither **D.** I don't know, dude

Part IV: Short Answer [10 points each]
Show enough work. Clearly mark your final answers. Partial credit given when deserved.

17. The following graph defines a function, $y = f(x)$. Use the graph to (a) identify the parent function, (b) list all transformations (in an acceptable order), and then (c) carefully write an equation of the function.



18. Find an equation of the line passing through the point $P(1, -2)$ and parallel to the line $6x - 12y = 36$. Give your answer in slope-intercept form.