1) Identify the symmetry: $f(x)=x^{2}+x-4$
a. Symmetrical to the $x$-axis
c. Symmetrical to the $y$-axis
b. Symmetrical to the origin
d. Not symmetrical
2) Identify the symmetry: $f(x)=x^{3}-6 x$
a. Symmetrical to the $x$-axis
c. Symmetrical to the $y$-axis
b. Symmetrical to the origin
d. Not symmetrical
3) Identify the symmetry: $f(x)=x^{4}+8$
a. Symmetrical to the $x$-axis
c. Symmetrical to the $y$-axis
b. Symmetrical to the origin
d. Not symmetrical

True or false:
4) A function can be symmetrical to an axis AND the origin at the same time.
5) A function can be symmetrical to the $x$-axis.
6) A function can be symmetrical to the $y$-axis AND have a $y$-intercept.
7) If ( $3,-2$ ) is a point on a graph that is symmetric with respect to the $x$-axis, then $(-3,-2)$ is also a point on the graph.
8) Find all intercepts of the function $f(x)=x^{2}+8 x-20$. MORE THAN ONE ANSWER IS POSSIBLE!
a. $(0,-20)$
b. $(10,0)$
c. $(2,0)$
d. $(-10,0)$
e. $(-2,0)$
f. $(-20,0)$
9) Find all intercepts of the function $f(x)=x \sqrt{16-x^{2}}$. MORE THAN ONE ANSWER IS POSSIBLE!
a. $(16,0)$
b. $(4,0)$
c. $(0,4)$
d. $(-4,0)$
e. $(0,0)$
f. $(0,16)$
10) Find the points of intersection of the graphs of the following equations: MORE THAN ONE ANSWER IS POSSIBLE!

$$
\begin{aligned}
& x-y=1 \\
& x^{2}+y^{2}=5
\end{aligned}
$$

a. $(3,2)$
d. $(0,-1)$
b. $(-1,-2)$
e. $(2,1)$
c. $(\sqrt{5}, 0)$
f. None of these
11) Find the line that is perpendicular to $y-2 x=4$ that passes through the point $(2,7)$
a. $y=2 x+3$
d. $y=-1 / 2 x+8$
b. $y=-2 x+11$
e. $y=2 x+4$
c. $y=1 / 2 x+6$
f. None of these
12) Find the line that is parallel to $y-2 x=4$ that passes through the point $(2,7)$
a. $y=2 x+3$
d. $y=-1 / 2 x+8$
b. $y=-2 x+11$
e. $y=2 x+4$
c. $y=1 / 2 x+6$
f. None of these

Match:
13) General Form
a. $y=m x+b$
14) Vertical line
b. $y-b=m x$
15) Horizontal line
c. $y=b$
16) Point-slope form
d. $y-y_{1}=m\left(x-x_{1}\right)$
17) Slope-intercept form
e. $x=a$
f. $A x=B y$
g. $A x+B y+C=0$
18) Find the slope of the line passing through the points $(3,-1),(-2,-6)$
19) Find the $y$-intercept of the line that passes through the points $(3,-1),(-2,-6)$
20) True or false: The following points are collinear $(2,-2),(-2,1)(-1,0)$
21) True or false: It is possible for two lines with negative slopes to be perpendicular.
22) Given $f(x)=x^{2}-3$, find $f(8)$
23) Given $f(x)=x^{2}-3$, find $\frac{f(x+\Delta x)-f(x)}{\Delta x}$
a. $\Delta x$
c. $2 x+\Delta x$
b. $\frac{x^{2}+\Delta x^{2}-3}{\Delta x}$
d. None of these

Water runs into a vase of height 30 centimeters at a constant rate. The vase is full after 5 seconds. Use this information and the shape of the vase shown to answer questions $24-28$ if $d$ is the depth of the water in centimeters and t is the time in seconds.
24) True or false: $d$ is a function of $t$.
25) True or false: $t$ is a function of $d$.
26) Determine the domain of the function.
a. $(0,5)$
d. $[0,5]$
b. $[0,5)$
e. None of these
c. $[5,30)$
27) Determine the range of the function.
a. $(0,30)$
d. $[0,30]$
b. $[0,30)$
e. None of these
c. $[5,30)$
28) Which of the following graphs could be a model of the function?
b.

c.

d.

a.


Determine whether the function is even, odd or neither
29) $f(x)=x^{2}+2 x+2$
a. Even
b. Odd
c. Neither
30) $g(x)=1+\sin x$
a. Even
b. Odd
c. Neither
31) $h(x)=x^{4}-x^{2}$
a. Even
b. Odd
c. Neither
32) $m(x)=x \cos x$
a. Even
b. Odd
c. Neither
33) An open box is to be made from a rectangular piece of material 9 inches by 12 inches by cutting equal squares from each corner and turning up the sides. Let $x$ be the length of each side of the square cut out of each corner. Write the volume $V$ of the box as a function of $x$.
a) $\quad V=x^{3}$
b) $\quad V=108 x$
c) $\quad V=x(9-x)(12-x)$
d) $\quad V=x(9-2 x)(12-2 x)$
e)
None of these

Use the graphs to the right to answer questions $34-39$. MORE THAN ONE ANSWER IS POSSIBLE FOR EACH QUESTION. GRAPHS MAY BE USED MORE THAN ONCE.
34) Which of the graphs represent a cubic function?
35) Which graphs have a positive leading coefficient?
36) What is the minimum degree of (d)?
(a)

(b)

37) Which of the graphs represent a quadratic function?
38) How many zeros does (b) have?
39) True or false: all graphs represent polynomial functions.
(c)

(d)

40) Find the equation of the vertical line that passes through the point ( $-1,4$ )
a. $x=-1$
b. $x=4$
c. $y=4$
d. $\quad y=-1$
e. None of these

