

You must show the solution process not merely the answer to receive full credit. Write in a neat and organized fashion. Circle or box-in your answers. 100 pts.

- 1) Outline the step by step procedure (text) you use to solve a quadratic equation. (4 pts)

Solve each of the following equations algebraically. (5 pts each)

- 2) Solve for x:

$$15 - 4(2x - 3) = 3 - 2(5x - 9)$$

- 3) Solve for p:

$$\frac{2 - x}{3} + \frac{3}{2} = 4 - \frac{3(2x - 5)}{2}$$

- 4) Solve for x:

$$ax + 5 = bx + k$$

- 5) Solve for y:

$$ax + by = 5x + 7y + 12$$

6) Solve for x:
 $3x^2 + 5x = 2$

7) Solve for y:
 $3(y + 7) - 12y = 3(8 - 3y)$

8) Solve for y:
 $3(2x - 5y) = 7 - (3x + 7y)$

9) Solve for x:
 $(3x + 2)(2x - 5) = 6x + 165$

10) Explain how to solve an equation of the form $f(x) = g(x)$ using the graphing features of the calculator. (3 pts)

11) Use your graphing calculator to solve $\frac{x^3 - 36x}{9} = \frac{1 - x^2}{20}$ (2 pts)

12) Graph $y = -0.1x^3 + 0.6x^2 + 3.6x + 5$ and adjust the viewing window to see all roots, y-intercepts and extrema. Then list their coordinates. (1 pts each)

Roots:

y-intercept:

local max:

local min:

13) Find the equation of the line connecting (1.2, 12.5) & (-5.6, -4.5). Use slope-intercept form and give m & b as decimals. (5 pts)

14) $f(x) = 3x^2 + x$ (2 pts each)

(a) $f(k) =$

(b) $f(5) =$

(b) $3f(2) + 4 =$

(c) $f(x + 2) =$

(d) $f(x + h) =$

15) A drug study assigns subjects consecutive ID's beginning at 100 and ending at 482. This is variable N. Each subject is given one dose (mg) of an experimental drug. That variable is D. (1 pt each)

(a) Which is the independent variable?

ID

Dose

(b) Is this relation a function?

YES

NO

(c) Describe the domain in words. _____

(d) What does $f(150) = 200$ mean _____

16) Give the domain of each function: (2 pts each)

(a) $y = \sqrt{x - 2}$

(b) $y = \frac{x^2 + 1}{x - 5}$

(c) $y = ax^2 + bx + c$

17) Simplify to all positive exponents: (2 pts each)

(a) $3x^{-4} x^5 x^7 =$ _____

(b) $2(x^2 y^3)^4 =$ _____

(c) $\frac{x^{-5} y^3}{x^3 y^{-2}} =$ _____

18) An oil field produced 30 bbl/day in 2005, 44 bbl/day in 2008 and 52 bbl/day in 2010. Assume the oil production will obey a quadratic. Let $x = 0$ correspond to 2000. (2 pts each)

(a) Use regression to model the oil production $P(x)$. $P(x) =$ _____

(b) Use your equation to estimate the date the field went into production. _____

(c) Use your equation to determine when production will drop to 20 bbl/day. _____

(d) Use your equation to estimate the date the field is depleted. _____

19) Graph of $g(x)$ is shown here. (2 pts ea)

$g(-2) =$ _____

$g(4) =$ _____

$g(x)$ is a function: YES NO

Domain of $g(x)$: _____

