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## Review - 3rd Quarter Exam Algebra I CP ~ Chapters 7, 9, 10

1. A new inkjet printer priced at $\$ 130$ increases $5 \%$ each year. How much will a similar model cost in two years?
2. The amount of money, $A$, accrued at the end of $t$ years when a certain amount, $P$, is invested at a compound annual rate, $r$, is given by $A=P(1+r)^{t}$. If a person invests $\$ 240$ in an account that pays $8 \%$ interest compounded annually, find the balance after 10 years.
3. A population of 290 animals at the local zoo increases at an annual rate of $9 \%$. Predict how many animals there will be after 5 years.
4. Which graph describes this function $y=\left(\frac{1}{3}\right)^{x}$ ?
a.

b.

c.

d.

5. A certain radioactive material decays $45 \%$ each year. If there is 96 grams of the material to start with, how much radioactive material is left after 10 years? Round your answer to two decimal places.
6. Write an exponential function to model the situation.

A population of 250 animals decreases at an annual rate of $19 \%$.
a. $\quad y=250(1.81)^{x}$
b. $y=250(0.19)^{x}$
c. $y=250(1.19)^{x}$
d. $y=250(0.81)^{x}$
7. Which sketch is the graph of the equation $y=-3 x^{2}$.
a.
b.

c.

d.

8. Which sketch is the graph of the equation $y=0.75 x^{2}$.
a.

b.

c.

d.


Describe how the graph of the functions for $9-14$ compare to the graph of $y=x^{2}$.
9. $y=3 x^{2}$
10. $y=-4 x^{2}$
11. $y=-\frac{1}{6} x^{2}$
12. $y=0.5 x^{2}$
13. $y=x^{2}+8$
14. $y=x^{2}-2$
15. Sketch the graph of the equation $y=-\frac{5}{7} x^{2}$.
a.

b.

c.

d.

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## Graph:

16. $y=x^{2}+6$
a.

b.

c.

d.


Find the solutions of the function for problems 37-39. Round to nearest hundredth.
17. $3 x^{2}=108$
18. $2(x+4)^{2}=98$
19. $x^{2}=9$
20. $5 x^{2}=75$
21. A ball is dropped from a tall building. Use Galileo's formula $d=16 t^{2}$ to find how many seconds does it take for the ball to drop 200 feet to hit the ground? Round your result to two decimal places.
22. $3(x+6)^{2}=33$
23. $7 x^{2}-4=100$
24. Solve the following system of equations for the variables by graphing. $\left\{\begin{array}{l}y=x-1 \\ y=-x+5\end{array}\right.$
25. Use substitution to find the solution. $\left\{\begin{array}{l}y=2 x+6 \\ x=y-3\end{array}\right.$
26. Use substitution to solve the system of equations. $\left\{\begin{array}{l}y=3 x+5 \\ x+y=-1\end{array}\right.$
27. Solve the system using addition/multiplication method (also known as elimination method). $\left\{\begin{array}{l}3 x-4 y=-16 \\ x-4 y=-40\end{array}\right.$
28. Solve the system using addition/multiplication method (also known as elimination method). $\left\{\begin{array}{l}x+y=-3 \\ 5 x+7 y=-9\end{array}\right.$
29. Solve the system using addition/multiplication method (also known as elimination method). $\left\{\begin{array}{l}5 x-2 y=53 \\ 2 x+6 y=11\end{array}\right.$
30. Solve the system using addition/multiplication method (also known as elimination method). $\left\{\begin{array}{l}4 x-3 y=39 \\ 7 y=4 x-79\end{array}\right.$
31. What is true about the slopes of parallel lines?
32. Which two of the following lines are parallel?
a. $y=8 x+500$
b. $y=2 x+500$
c. $y=8 x+600$
d. $x=2 y+500$
33. Does the following system represent intersecting lines, parallel (non-intersecting) lines, or coincident lines?
$\left\{\begin{array}{l}10 x+5 y=-15 \\ y=-2 x-3\end{array}\right.$
34. Does the following system represent intersecting lines, parallel (non-intersecting) lines, or coincident lines?
$\left\{\begin{array}{l}4 x+6 y=11 \\ y=-\frac{2}{3} x+7\end{array}\right.$
35. Ben's grandmother leaves money to her two favorite charities in her will. The American Heart Association is to get 1.5 times as much money as the local Wildlife Refuge. The total amount of money donated in the will is $\$ 39,000$.
a. Write a system of equations describing this situation.
b. Solve to find the amount of money each charity will recieve.
36. John received his results for the SAT tests. His mathematics score is 70 points higher than his verbal score. His total score for the two parts is 1,350 .
a. Let $\mathrm{v}=$ John's verbal score and $\mathrm{m}=$ John's math score. Write a system of equations for this situation.
b. Find John's two scores.
37. The sum of two numbers is 1,963 and their difference is 1,865 . What are the numbers?
38. A hotel offers the following specials. The economy plan includes a two-night stay and one meal for $\$ 149$. The luxury plan includes a 2 -night stay and 4 meals for $\$ 197$. What is the price per night and the price per meal?
39. A test has both multiple choice and open-ended questions. If the multiple choice questions are worth 3 points each and the open-ended questions are worth 5 points each, then the test is worth a total of 103 points. If the multiple choice questions are worth 5 points each and the open-ended questions are worth 7 points each, then the test is worth a total of 161 points. How many multiple choice questions and how many open-ended questions are on the test?
40. A security guard counted 90 vehicles in a parking lot. The only vehicles in the lot were cars and motorcycles. To double-check his count, the security guard counted 248 wheels. How many motorcycles and how many cars were in the parking lot?
41. Does the following system represent intersecting lines, parallel (non-intersecting) lines, or coincident lines? Show by solving.
$\left\{\begin{array}{l}\frac{3}{4} x+\frac{1}{2} y=4 \\ 6 x-4 y=32\end{array}\right.$
42. Graph the solution to the following system on the grid below. $\left\{\begin{array}{l}x>0 \\ y>0 \\ x+4 y \geq 8\end{array}\right.$

43. Graph the solutions to the following system of inequalities. $\left\{\begin{array}{l}y \leq-2 x-3 \\ x-y>-4\end{array}\right.$

44. Given the graph below. Write a system of inequalities that represents the shaded portion.

45. What is the solution to the following non-linear system of equations?

46. Graph the following nonlinear system of equations on the grid below. $\left\{\begin{array}{l}y=x^{2}-4 \\ y=\frac{3}{2} x+2\end{array}\right.$

Hint: Make a T-chart for the quadratic and plot the points. Use the y-intercept and the slope to plot the linear equation.


