Sheet #242: Algebra & Graphs

Name _____ Per/Sec. _____

Graphing calculator needed.

Simplify.

1. $(-3r^4)^3$
2. $\left(-\frac{2c}{d}\right)^6$
3. $(6t^{-5})^{-1}$
4. $(-3x-5y)-(8x+2y)$

Multiply.

5. $-7y(-2y^2+y+10)$
6. $(d+6)(3d+2)$
7. $(x-y)(x-y+z)$

Simplify.

8. $(3y^3+15y^2)\div(y+5)$

Factor.

9. $k^2-12k+27$
10. $5y^2-4y-1$
11. x^2-36

Solve.

12. $(b+1)(b-1)=0$
13. $0=p^2-36$
14. $18+5x-2x^2=0$

Simplify.

15. $\frac{3a+4}{5a^2}\div\frac{3a+4}{10a}$
16. $\frac{w}{5}+\frac{5}{w}$
17. $-\sqrt{45}$
18. $\frac{11}{\sqrt{11}}$
19. $\frac{2}{1-\sqrt{3}}$

Solve by any method.

20. $3y^2 - 27 = 0$

Solve using the quadratic formula.

21. $21 - 2v = 3v^2$

Simplify.

22. $(6 + 3i) + (3 - 9i)$

23. $(10 - 4i)(1 - 4i)$

24. $\dfrac{-4}{-5 + i}$

Solve.

25. $p^2 - p + 3 = 0$

Find the center and radius of the circle.

26. $(x - 4)^2 + (y + 3)^2 = 6$

27. Find the equation of the circle with center $(5, -4)$ and radius $r = 2\sqrt{5}$.

Write the equation of the line.

28. slope $= -4$, contains point $(2, -5)$

29. passes through $(2, 4)$ and $(-1, 7)$

30. An apple is launched vertically from ground ($y = 0$ m) at time = 0 s. Its height, y, is modeled to be $y = -5t^2 + 20t$ m above ground as a function of time, t, in seconds.

    a) At what time does the projectile reach its maximum height?

    b) What is the maxiumum height of the projectile?

    c) At what time will the apple reach the ground?

31. A rectangular room is 17 m longer than it is wide. Its area is 4218 m^2. Find the length and width of the room. (Set up an equation for area in terms of x, where x represents the width. Solve the equation using any method.)

32. Consider the equation $y = (x+3)^2 - 5$.

a) Sketch its graph. Label the axes with units and variables.

b) Find the x and y coordinates of the vertex.

c) Compared to its parent graph, $y = x^2$, how has the graph of the equation above been shifted and/or stretched?

d) Find the y intercept.

e) Find the x intercepts with a calculator. Round to 3 decimals.

f) Solve for the x intercepts ALGEBRAICALLY, showing the steps.