

Semester One Review Packet ~ Due: _____
→ Work Must be Shown When Applicable ←

Keep and correct this packet, as it will come in handy when studying for standardized tests: ACT/SAT and college placement exams.

Pace yourself – Do not wait until the night before it is due.

On the exam, you may use a “*CHEAT SHEET*.”

- Computer / Lined Paper ($8\frac{1}{2}$ inches by 11 inches)
- Front and Back Permitted
- Formulas / Examples / Reminders / Words of Encouragement...
- Handwritten or Printed (for smaller font)
- Nontransferable During Exam
- Advisable to Make Additions While Completing the Packet
- Advisable to Make Items Easy To Find
- Keep for Future Classes/Exams...

*You will most likely find that the cheat sheet will only serve as a “crutch.” If you do not know how to use the formulas, it will not help.

On exam day, bring:

- ✓ Calculator You're Familiar With
- ✓ Cheat Sheet
- ✓ Pencil
- ✓ Scrap Paper
- ✓ Something to Keep You Busy

*Headphones / Phones are only permitted when your exam is submitted and must not be heard by anyone but yourself.

IMPORTANT: NO ASSIGNMENTS WILL BE ACCEPTED AFTER SCHEDULED FINAL EXAMS.

Good luck on the exam and in the future. I hope you learned a lot this semester! 😊

Advanced Algebra II ~ 2nd Semester REVIEW

What is the simplified form of each expression?

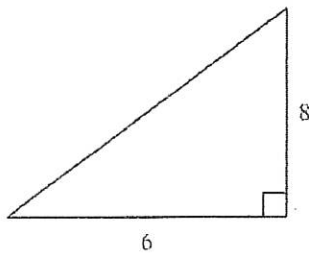
1. $\frac{c^9 d^{-7}}{c^{14} d^{-10}}$

What is the simplified form of the expression?

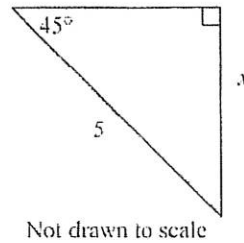
2. $\left(\frac{3}{5y^9}\right)^3$

Find the length of the missing side. The triangle is not drawn to scale.

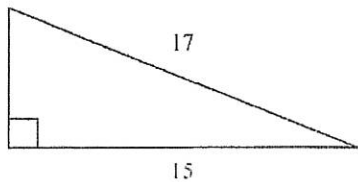
3.



5. Find the value of the variable. If your answer is not an integer, leave it in simplest radical form.

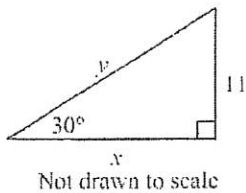


4.



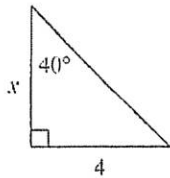
Find the value of the variable(s). If your answer is not an integer, leave it in simplest radical form.

6.



Use a trigonometric ratio to find the value of x . Round your answer to the nearest tenth.

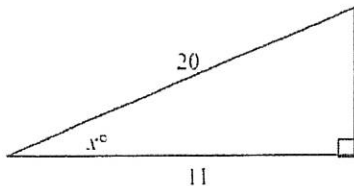
7.



Not drawn to scale

Find the value of x . Round to the nearest degree.

8.



Not drawn to scale

9. Prestige Builders has a development of new homes. There are four different floor plans, seven exterior colors, and an option of either a two-car or a three-car garage. How many choices are there for one home?
10. In how many ways can 11 basketball players be listed in a program?
11. A mathematics journal has accepted 14 articles for publication. However, due to budgetary restraints only 9 articles can be published this month. How many ways can the journal editor assemble 9 of the 14 articles for publication?
a. 726,485,760 b. 14 c. 2,002 d. 126
12. 9 students volunteer for a committee. How many different 6-person committees can be chosen?
13. In a word game, you choose a tile from a bag, replace it, and then choose another. If there are 24 vowels and 15 consonants, what is the probability you will choose a consonant and then a vowel?

Suppose S and T are mutually exclusive events.
Find $P(S \text{ or } T)$.

14. $P(S) = 20\%$, $P(T) = 22\%$

What is a simpler form of the radical expression?

15. $\sqrt[4]{81x^{20}y^8}$

16. $\sqrt[3]{27x^{15}y^{24}}$

What is the simplest form of the product?

17. $\sqrt[3]{7x^7} \cdot \sqrt[3]{9x^4}$

18. $\frac{\sqrt[3]{270x^{20}}}{\sqrt[3]{5x}}$

What is the product of the radical expression?

19. $(-5 - \sqrt{3})^2$

What is the solution of the equation?

23. $4(3 - x)^{\frac{4}{3}} - 5 = 59$

How can you write the expression with rationalized denominator?

20. $\frac{\sqrt{3} - \sqrt{6}}{\sqrt{3} + \sqrt{6}}$

What is the solution of the equation? Eliminate any extraneous solutions.

24. $5x = \sqrt{10 + 15x}$

21. Write the exponential expression $3x^{\frac{3}{8}}$ in radical form.

25. $\sqrt{3x + 28} - 8 = x$

What is the simplest form of the number?

22. $\sqrt{2}(\sqrt[8]{2})$

a. 1024 b. $2^{\frac{5}{8}}$ c. $2^{\frac{8}{5}}$ d. $2^{\frac{1}{10}}$

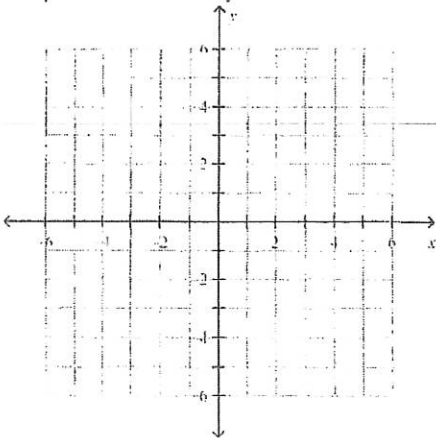
26. Let $f(x) = -2x - 7$ and $g(x) = -4x + 3$. Find $(f \circ g)(-5)$.

27. Let $f(x) = x^2 + 6$ and $g(x) = \frac{x+8}{x}$. Find $(g \circ f)(-7)$.

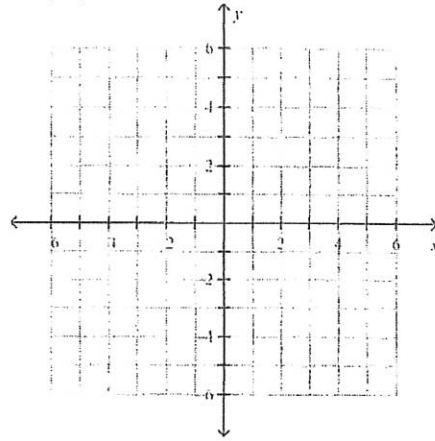
What is the inverse of the given relation?

28. $y = 7x^2 - 3$.

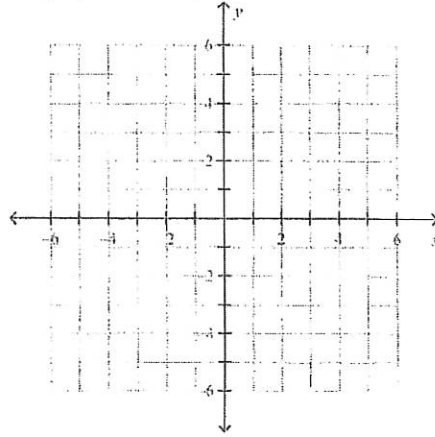
29. Graph the inverse of $y = -4x^2 - 2$.



30. Graph $y = \sqrt{x+3}$.



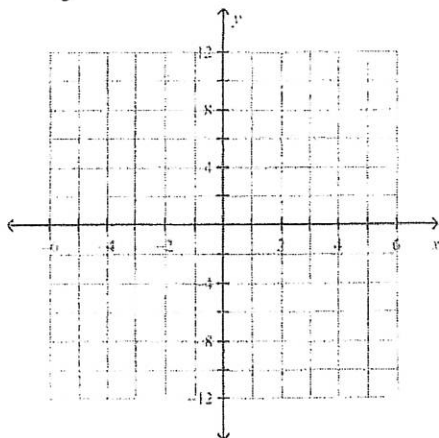
31. Graph $y = -0.5\sqrt{x-2} + 2$.



32. Without graphing, determine whether the function $y = 7\left(\frac{2}{3}\right)^x$ represents exponential growth or exponential decay.

Graph the function.

33. $y = \frac{1}{5} (3)^x$



34. Use the table feature on a graphing calculator to evaluate $e^{1.8}$ to four decimal places.

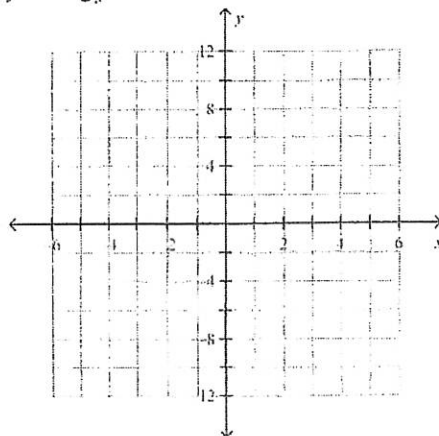
35. Suppose you invest \$1600 at an annual interest rate of 4.6% compounded continuously. How much will you have in the account after 4 years?

Evaluate the logarithm.

36. $\log_5 \frac{1}{625}$

Graph the logarithmic equation.

37. $y = \log_3 x$



Write the expression as a single logarithm.

38. $4 \log x - 6 \log (x + 2)$

41. Solve $\log 5x + \log 14 = 1$. Round to the nearest hundredth if necessary.

39. Use the Change of Base Formula to evaluate $\log_7 40$.

Solve the exponential equation.

40. $4^{4y} = 8$

42. Solve $\ln x - \ln 6 = 0$.

Use natural logarithms to solve the equation. Round to the nearest thousandth.

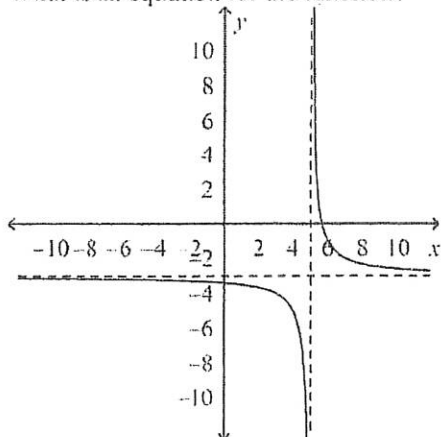
43. $e^{2x} = 1.4$

45. Write an equation for the translation of $y = \frac{4}{x}$ that has the asymptotes $x = 7$ and $y = 6$.

44. Suppose that x and y vary inversely, and $x = 10$ when $y = 8$. Write the function that models the inverse variation.

46. This graph of a function is a translation of $y = \frac{2}{x}$.

What is an equation for the function?



47. Describe the vertical asymptote(s) and hole(s) for the graph of $y = \frac{(x-3)(x-1)}{(x-1)(x-5)}$.

48. Find the horizontal asymptote of the graph of $y = \frac{-2x^3 + 3x + 2}{2x^3 + 6x + 2}$.

What is the product in simplest form? State any restrictions on the variable.

49. $\frac{3g^5}{10h^2} \cdot \frac{h^5}{10g^2}$

What is the quotient in simplified form? State any restrictions on the variable.

50. $\frac{a+2}{a-5} \div \frac{a+1}{a^2-8a+15}$

Simplify the sum.

51. $\frac{a^2+7a+10}{a^2+2a-15} + \frac{10}{a-3}$

Simplify the difference.

$$52. \frac{n^2 - 10n + 24}{n^2 - 13n + 42} - \frac{9}{n - 7}$$

Solve the equation. Check the solution.

$$53. \frac{-4}{x + 1} = \frac{-1}{x + 5}$$

$$54. \frac{a}{a^2 - 36} + \frac{2}{a - 6} = \frac{1}{a + 6}$$

Write an equation of a circle with the given center and radius.

55. center $(2, -4)$ and radius 5

56. Will the parabola open up, down, left, or right?
 $x = 5y^2$

Match the equations in numbers 57-60 with an appropriate conic section.

- a. circle
- b. ellipse
- c. hyperbola
- d. parabola

57. $2x^2 + 3y^2 = 36$

58. $2x^2 - 3y^2 = 36$

59. $3x^2 + 3y^2 = 36$

60. $2x^2 + 3y = 36$