

PreCalc 11 Chapter 3 Review Pack v1**Multiple Choice**

Identify the choice that best completes the statement or answers the question.

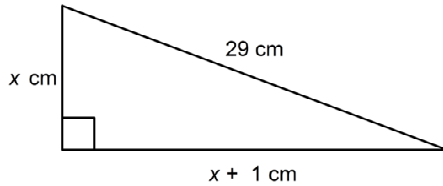
- _____ 1. Factor: $4x^2 - 25y^2$
- A. $(2x + 5y)(2x - 5y)$ C. $(2x + 5)(2x - 5)$
B. $(2x - 5y)(2x - 5y)$ D. $(5x + 2y)(5x - 2y)$
- _____ 2. Factor: $25m^2 - 40m + 16$
- A. $(5m - 16)(5m - 1)$ C. $(5m + 4)^2$
B. $(5m - 4)(5m + 4)$ D. $(5m - 4)^2$
- _____ 3. Factor this polynomial: $120x^2 - 52x - 224$
- A. $(5x + 8)(6x - 7)$ C. $4(5x + 8)(6x + 7)$
B. $4(5x - 8)(6x + 7)$ D. $(5x - 8)(24x - 28)$
- _____ 4. Factor this polynomial: $\frac{15}{4} - x - x^2$
- A. $\frac{1}{4}(5 - 2x)(3 + 2x)$ C. $\frac{1}{2}(5 + 2x)(3 - 4x)$
B. $\frac{1}{2}(5 - 2x)(3 + 4x)$ D. $\frac{1}{4}(5 + 2x)(3 - 2x)$
- _____ 5. Factor this polynomial expression: $2(3x - 2)^2 + 9(3x - 2) - 5$
- A. $3(x + 1)(6x - 5)$ C. $2(3x + 2)(x - 5)$
B. $2(3x - 2)(x + 5)$ D. $3(x - 1)(6x + 5)$
- _____ 6. Which statement is true for the equation $x = \sqrt{6x + 7}$?
- A. 7 and -1 are roots.
B. 7 is a root of the original equation and -1 is an extraneous root.
C. 1 is a root of the original equation and -7 is an extraneous root.
D. 7 and 1 are both extraneous roots.

30. The formula $h = -5t^2 + 442$ models the height, h metres, of an object t seconds after it is dropped from the top of a tower that is 442 m tall.
- When will the object hit the ground? Give the answer to the nearest tenth of a second.
 - What is the height of the object 5 s after it is dropped from the top of the tower?
31. Consider the quadratic equation $x^2 + bx + 5 = 0$, where b is a constant. Determine the possible values of b so that this equation has real solutions.
32. A car was travelling at a constant speed of 15 m/s, then accelerated for 10 s. The distance travelled during this time, d metres, is given by the formula $d = 15t + 0.7t^2$, where t is the time in seconds since the acceleration began. How long did it take the car to travel 500 m? Give the answer to the nearest tenth of a second.
33. Consider this quadratic equation: $\frac{1}{4}x^2 - 2x + \frac{3}{8} = 0$
- Rewrite the equation so that it does not contain fractions.
 - Solve the equation. Give the answer to 3 decimal places.
34. a) Calculate the value of the discriminant for the equation $1.45x^2 - 1.6x - 1.2 = 0$.
b) How many roots does the equation have?
35. A model rocket is launched. Its height, h metres, after t seconds is described by the formula $h = -4.9t^2 + 21t$. Without solving the equation, determine whether the rocket reaches a height of 30 m.
36. a) Determine the value of the discriminant for this equation: $3x^2 - 5x - 12 = 0$
b) Use the value of the discriminant to choose a solution strategy, then solve the equation.

Problem

37. Solve this equation, then verify the solution: $\sqrt{x+14} = x - 16$
Explain your steps.

38. Determine the lengths of the legs in this right triangle. Explain your strategy.



39. Solve $x^2 - 13x - 7 = 0$ by completing the square. Show your work.
40. Consider the quadratic equation $2x^2 + 10x + c = 0$, where c is a constant. Determine the possible values of c so that this equation has 2 real solutions. Explain your strategy.

41. A student wrote the solution below to solve this quadratic equation: $2x^2 - 12x - 13 = 0$

$$2x^2 - 12x - 13 = 0$$

$$2x^2 - 12x = 13$$

$$2(x^2 - 6x) = 13$$

$$2(x^2 - 6x + 9) = 13 + 9$$

$$2(x - 3)^2 = 22$$

$$(x - 3)^2 = 11$$

$$x - 3 = \pm\sqrt{11}$$

$$x = 3 \pm \sqrt{11}$$

The roots are: $x = 3 + \sqrt{11}$ and $x = 3 - \sqrt{11}$

Identify the error, then write the correct solution.

42. A ball is thrown in the air. The approximate height of the ball, h metres, after t seconds can be modelled by the equation $h = -5t^2 + 20t$. Will the ball ever reach a height of 15 m? Explain your answer.
43. a) Solve this quadratic equation by expanding, simplifying, then applying the quadratic formula:
 $(x + 2)^2 - 3(x + 2) - 7 = 0$
 b) Solve the equation in part a using the quadratic formula without expanding.
44. Determine the values of k for which the equation $9x^2 - kx + 1 = 0$ has exactly one real root, then write a possible equation.