

PreCalc 11 Chapter 3 Review Pack v2**Multiple Choice**

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

- _____ 1. Factor: $49x^2 - 16y^2$
- A. $(4x + 7y)(4x - 7y)$ C. $(7x + 4y)(7x - 4y)$
B. $(7x - 4y)(7x - 4y)$ D. $(7x + 4)(7x - 4)$
- _____ 2. Factor: $4m^2 - 36m + 81$
- A. $(2m + 9)^2$ C. $(2m - 9)^2$
B. $(2m - 81)(2m - 1)$ D. $(2m - 9)(2m + 9)$
- _____ 3. Factor this polynomial: $24x^2 - 52x - 112$
- A. $4(2x + 7)(3x + 4)$ C. $(2x - 7)(12x - 16)$
B. $(2x + 7)(3x - 4)$ D. $4(2x - 7)(3x + 4)$
- _____ 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 $x = \sqrt{-x + 6}$?
- A. 2 and -3 are roots.
B. 2 and 3 are both extraneous roots.
C. 3 is a root of the original equation and -2 is an extraneous root.
D. 2 is a root of the original equation and -3 is an extraneous root.

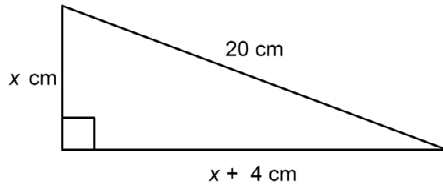
- _____ 7. Which equations are quadratic equations?
i) $x^2 = 0$ ii) $x^2 = x$
iii) $x(x-2) = 0$ iv) $\sqrt{x-4} = 2$
A. i and iii C. i, ii, and iii
B. ii and iii D. All of the above
- _____ 8. Solve by factoring: $3x^2 - 27 = 0$
A. $x = 9$ or $x = -9$ C. $x = 9$
B. $x = 3$ or $x = -3$ D. $x = 3$
- _____ 9. Solve by factoring: $6x^2 - 19x + 15 = 0$
A. $x = \frac{3}{2}$ or $x = -\frac{5}{3}$ C. $x = \frac{3}{2}$ or $x = \frac{5}{3}$
B. $x = -\frac{3}{2}$ or $x = \frac{5}{3}$ D. $x = -\frac{3}{2}$ or $x = -\frac{5}{3}$
- _____ 10. Solve by factoring: $4x^2 - 13x = 12$
A. $x = 1$ or $x = 3$ C. $x = -3$ or $x = 1$
B. $x = -\frac{3}{4}$ or $x = 4$ D. $x = -\frac{3}{4}$ or $x = -4$
- _____ 11. Solve this equation: $(x-7)^2 - 9 = 30$
A. $x = -7 \pm \sqrt{21}$ C. $x = -7 \pm \sqrt{39}$
B. $x = 7 \pm \sqrt{21}$ D. $x = 7 \pm \sqrt{39}$
- _____ 12. For which quadratic equation is $2 + \sqrt{5}$ a solution?
A. $x^2 - 4x = 1$ C. $x^2 - 2x = 5$
B. $x^2 - 2x = 3$ D. $x^2 - 4x = 3$
- _____ 13. A square garden in a city park is to be expanded. The length of each side of the garden is to be increased by 10 m. The area of the new garden will be 121 m^2 . Determine the side length of the original garden.
A. 21 m B. $\sqrt{1}$ m C. 11 m D. 1 m

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 $x^2 + bx + 3 = 0$, 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 19 m/s, then accelerated for 10 s. The distance travelled during this time, d metres, is given by the formula $d = 19t + 0.7t^2$, where t is the time in seconds since the acceleration began. How long did it take the car to travel 1100 m? Give the answer to the nearest tenth of a second.
33. Consider this quadratic equation: $-\frac{1}{2}x^2 - \frac{3}{4}x + 1 = 0$
- 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 $-2.15x^2 - 1.2x + 0.8 = 0$.
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 $h = -4.9t^2 + 33t$. 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: $x^2 + 5x - 14 = 0$
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 $x^2 - 11x - 11 = 0$ by completing the square. Show your work.
40. Consider the quadratic equation $2x^2 + 6x + c = 0$, 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: $2x^2 - 8x - 15 = 0$

$$2x^2 - 8x - 15 = 0$$

$$2x^2 - 8x = 15$$

$$2(x^2 - 4x) = 15$$

$$2(x^2 - 4x + 4) = 15 + 4$$

$$2(x - 2)^2 = 19$$

$$(x - 2)^2 = \frac{19}{2}$$

$$x - 2 = \pm \sqrt{\frac{19}{2}}$$

$$x = 2 \pm \sqrt{\frac{19}{2}}$$

The roots are: $x = 2 + \sqrt{\frac{19}{2}}$ and $x = 2 - \sqrt{\frac{19}{2}}$

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 $h = -5t^2 + 15t$. Will the ball ever reach a height of 25 m? Explain your answer.
43. a) Solve this quadratic equation by expanding, simplifying, then applying the quadratic formula:
 $(x + 2)^2 - 5(x + 2) - 9 = 0$
- b) Solve the equation in part a using the quadratic formula without expanding.