

Algebra 2 - Chapter 4B

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Test Re-take Review

Hour:

Solve by factoring.

1. $7n^2 + 63n + 140 = 0$

$7(n^2 + 9n + 20) = 0$

$(n+5)(n+4) = 0$

$n = -5$
 $n = -4$

3. $m^2 + 2m - 8 = 0$

$(m+4)(m-2) = 0$

$m = -4$ $m = 2$

Solve by any method.

5. $4x^2 + 20x + 25 = 0$

$x = \frac{-20 \pm \sqrt{20^2 - 4(4)(25)}}{2(4)}$

$x = \frac{-20 \pm \sqrt{400 - 400}}{8}$

$x = -\frac{20}{8}$ $x = -\frac{5}{2}$

2. $3x^3 = 27x^2$

$3x^3 - 27x^2 = 0$

$3x^2(x-9) = 0$

$3x^2 = 0$

$x-9 = 0$

$x = 0$

$x = 9$

4. $4v^2 + 3v = 7$

$4v^2 + 3v - 7 = 0$

$\frac{AC}{-2B}$

$4v^2 = 4v + 7v - 7 = 0$
 $4v(v-1) + 7(v-1) = 0$

$(v-1)(4v+7) = 0$

$v = 1$ $v = -\frac{7}{4}$

6. $x^2 - 1 = 8$

$x^2 = 9$

$x = \pm 3$

Solve by using the quadratic formula. List the exact answers *and* round to the nearest hundredth.

7. $7x^2 + 3x - 10 = -5$

$7x^2 + 3x - 5 = 0$

$$x = \frac{-3 \pm \sqrt{3^2 - 4(7)(-5)}}{2(7)}$$

$$x = \frac{-3 \pm \sqrt{9 + 140}}{14}$$

$$x = \frac{-3 \pm \sqrt{149}}{14} =$$

$$x = \frac{-3 + \sqrt{149}}{14} \approx 0.66$$

$$x = \frac{-3 - \sqrt{149}}{14} \approx -1.09$$

Solve by using the quadratic formula.

8. $7x^2 - 9x + 8 = 0$

$$x = \frac{9 \pm \sqrt{(-9)^2 - 4(7)(8)}}{2(7)}$$

$$= \frac{9 \pm \sqrt{81 - 224}}{14}$$

9. $2x^2 - 20x + 68 = 0$

$$x = \frac{9 \pm i\sqrt{143}}{14}$$

$$x = \frac{9 \pm \sqrt{-143}}{14}$$

Write the polynomial (in standard form) that has the given zeros.

10. 1, -15

$x = 1$ $x = -15$

$x - 1 = 0$ $x + 15 = 0$

$(x - 1)(x + 15) = 0$

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

$x^2 + 14x - 15 = 0$

11. 0, -2, 7

$x = 0$ $x = -2$ $x = 7$

$x = 0$ $x + 2 = 0$ $x - 7 = 0$

$x(x + 2)(x - 7) = 0$

$(x^2 + 2x)(x - 7) = 0$

$x^3 - 7x^2 + 2x^2 - 14x = 0$

$x^3 - 5x^2 - 14x = 0$

Find the C-value to complete the square.

12. $m^2 + 22m + \underline{121}$ $\left(\frac{22}{2}\right)^2 = 11^2$

13. $x^2 - 2x + \underline{1}$ $\left(\frac{-2}{2}\right)^2 = (-1)^2$

Solve each equation by completing the square. Write your answer in radical form (exact answers) and rounded to the nearest hundredth.

16. $x^2 - 8x + 10 = -4$

$$x^2 - 8x + \underline{16} = -14 + \underline{16}$$

$$\sqrt{(x-4)^2} = \sqrt{-2}$$

$$x-4 = \pm i\sqrt{2}$$

$$\boxed{x = 4 \pm i\sqrt{2}}$$

17. $k^2 + 4k = -8$

$$k^2 + 4k + \underline{4} = -8 + \underline{4}$$

$$\sqrt{(k+2)^2} = \sqrt{4}$$

$$k+2 = \pm 2$$

$$\boxed{k = -2 \pm 2i}$$

18. A ball is thrown into the air from a height of 7 feet with a velocity of 56 ft/s.

a) Write the equation for the height h of the ball at time t . $h(t) = \underline{-16t^2 + 56t + 7}$

b) After how many seconds will the ball reach its maximum height? Do not round your answer.

$$\frac{-b}{2a} = \frac{-56}{2(-16)} = \frac{-56}{-32}$$

$$\boxed{t = 1.75}$$

c) What will that maximum height be?

$$h(1.75) = -16(1.75)^2 + 56(1.75) + 7$$

$$\boxed{56 \text{ feet}}$$

d) After how many seconds will the ball hit the ground? Round your answer to the nearest hundredth.

$$-16t^2 + 56t + 7 = 0$$

$$x = \frac{-56 \pm \sqrt{56^2 - 4(-16)(7)}}{2(-16)}$$

$$\boxed{t \approx 3.62 \text{ seconds}}$$

$$x = \frac{-56 \pm \sqrt{3584}}{-32}$$

17. Mick Stupp drops a rock from a bridge over troubled waters. The bridge is 230 feet above the river. To the nearest hundredth of a second, how long will it take the rock to hit the water?

$$h(t) = -16t^2 + 230$$

$$-16t^2 + 230 = 0$$

$$-16t^2 = -230$$

$$t^2 = \frac{-230}{-16}$$

$$t = \pm \sqrt{\frac{-230}{-16}}$$

$$t \approx 3.79 \text{ seconds}$$

18. A metal box has a height of 6 cm. The width is w cm. The length is 30 cm longer than its width.

$$l = w + 30$$

- a) Write a polynomial that represents the volume of the box. ($V = lwh$)

$$V = 6 \cdot w \cdot (w + 30)$$

- b) For what values of x is this volume equal to 1050?

$$V = 1050 = 6 \cdot w \cdot (w + 30)$$

$$175 = w(w + 30)$$

$$175 = w^2 + 30w$$

$$0 = w^2 + 30w - 175$$

$$0 = (w + 35)(w - 5)$$

$$w = -35 \rightarrow \text{Not valid}$$

$$w = 5$$

- c) What is the length and width of the box?

$$l = 5 + 30$$

$$\text{length} = 35 \text{ cm}$$

$$\text{width} = 5 \text{ cm}$$