1.4

Solving Quadratic Equations

1) If the quadratic equation $2x^2 + 16x + 30 = 0$ is written in the form $(x - a)^2 = b$, then $a + b =$

A) - 3

B) - 4

C) - 2

D) 1

E) 5

2) If $x = a \mp b\sqrt{2}$ are the solutions of the quadratic equation $x^2 - 6x + 7 = 0$, then $a^2 + b^2 =$

A) 10

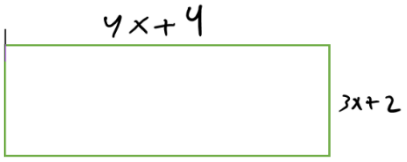
B) 13

C) 5

D) 25

E) 20

3) If the area of the rectangle below is 21 square feet, then its **perimeter** in feet, is



A) 19

B) 30

C) 20

D) 17

E) 32

4) If the quadratic equation $3x^2 + kx + 3 = 0$, has two distinct (different) real solutions, then the set of all values of k is

A) $(-\infty, -6) \cup (6, \infty)$

B) $(-\infty, -2) \cup (3, \infty)$

C) $(-\infty, -3) \cup (3, \infty)$

D) $(-6, 6)$

E) $(-3, 3)$

5) If the quadratic equation $kx^2 - (k - 3)x + 1 = 0$ has **two equal** solutions, then **one possible** value of k, is

A) 9

B) - 1

C) - 9

D) - 10

E) 10

6) If **4** is the sum and **1** is the product of the solutions of the equatic $2x^2 + bx + c = 0$, then $b + c$ =

A) - 6

B) - 10

C) 10

D) 6

E) 4

7) If the equation $(\sqrt{2}\,x + 1)(\sqrt{2}\,x - 1) + 6x = 1$ is written in the form $(x - a)^2 = b$, then $a + b =$

A) $\frac{7}{4}$

B) $\frac{19}{4}$

C) $\frac{\sqrt{13}}{2}$

D) $\frac{3}{4}$

E) $\frac{\sqrt{13}}{4}$

8) The values of k, in interval notation, for which the equation $x^2 + kx + 3k = 5$ has NO real solution, is

A) $(2, 10)$

B) $(0, 2)$

C) $(0, 12)$

D) $(-\infty, 2) \cup (10, \infty)$

E) $(-\infty, 0) \cup (12, \infty)$

9) The quadratic equation $ax^2 - 7x + c = 0$ has sum of solutions $7/6$ and product of solutions $-1/2$. The value of $a + c$ is

(a) 3

(b) -1

(c) -2

(d) 5

(e) -4

10)If $1+\sqrt{2}$ and $1-\sqrt{2}$ are the solutions of the quadratic equation $x^2+bx+c=0$, then $b+c=$

(a) -3
(b) -1
(c) $-2+2\sqrt{2}$
(d) 1
(e) 2

11)If the equation $(3x-4)(x+1)=-2$ is written in the form $(x+m)^2=n$ then $m+n=$

(a) $19/36$
(b) $-2/3$
(c) -1
(d) $35/36$
(e) 1

12)If the discriminant of the quadratic equation $2x^2+(3/5)x=k$ is $49/25$, where k is a constant, then the solution set of the equation contains

(a) one positive and one negative rational number
(b) two positive irrational numbers
(c) two positive rational numbers
(d) two negative rational numbers
(e) two negative irrational numbers

13)If the sum of squares of three consecutive positive integers a, b and c is 149, then $a+b+c$ is equal to

(a) 21
(b) 30
(c) 24
(d) 15
(e) 27

14)If the shorter sides of a right triangle have lengths k and $2k + 2$ and if the hypotenuse has length $k + 8$, then the value of $3k + 1$ is equal to:

(a) 16
(b) 10
(c) 46
(d) 4
(e) –8

15)The quadratic equation $ax^2 - 7x + c = 0$ has sum of solutions $7/6$ and product of solutions $-1/2$. The value of $a+c$ is

(f) 3
(g) –1
(h) –2
(i) 5
(j) –4

16)If $1+\sqrt{2}$ and $1-\sqrt{2}$ are the solutions of the quadratic equation $x^2+bx+c=0$, then $b+c=$

(f) -3
(g) -1
(h) $-2+2\sqrt{2}$
(i) 1
(j) 2

17)If the equation $(3x-4)(x+1)=-2$ is written in the form $(x+m)^2=n$ then $m+n=$

(f) 19/36
(g) $-2/3$
(h) -1
(i) 35/36
(j) 1

18)If the discriminant of the quadratic equation $2x^2+(3/5)x=k$ is $49/25$, where k is a constant, then the solution set of the equation contains

(f) one positive and one negative rational number
(g) two positive irrational numbers
(h) two positive rational numbers
(i) two negative rational numbers
(j) two negative irrational numbers

19)If the sum of squares of three consecutive positive integers a, b and c is 149, then $a+b+c$ is equal to

(f) 21
(g) 30
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20)If the shorter sides of a right triangle have lengths k and $2k + 2$ and if the hypotenuse has length $k + 8$, then the value of $3k + 1$ is equal to:

(f) 16
(g) 10
(h) 46
(i) 4
(j) –8

21) If the discriminant of the equation

$$\sqrt{2}x^2 + kx + \frac{\sqrt{2}}{5} = 0$$

is equal to $\frac{8}{45}$, then a possible value of k is

(a) $\frac{4}{3}$
(b) $\frac{2}{3}$
(c) $\frac{1}{3}$
(d) $\frac{5}{3}$
(e) 3

22) The value of k for which the quadratic equation

$$kx^2 + 3kx + (2k + 1) = 0$$

has two equal solutions is

(a) 4
(b) 0
(c) -4
(d) 1
(e) 2

23) The solutions of the equation

$$\frac{1}{2}x^2 + \frac{4}{3}x + 1 = 0$$

are

(a) $-\frac{4}{3} \pm \frac{\sqrt{2}}{3}i$

24) If the equation $(3x - 4)(x + 1) = -2$ is written in the form $(x + m)^2 = n$, then $m + n$ is equal to

(a) $\frac{19}{36}$

25) If the sum and the product of the two roots of the equation $2x^2 + bx + c = 0$ are -4, and $-\frac{3}{2}$ respectively, then $b + c$ is equal to

(a) 5

26) If the equation $-3x^2 + 6x + 5 = 0$ is written in the form $(x - a)^2 = b$,

then $a + b$ =

A) $\frac{11}{3}$

27) When completing the square in the equation $9x^2 - 12x + 9 = 0$

, we get $(x + a)^2 = b$, then $b - a^2$ is equal to:

A) -1

28) If completing the square in the equation $4x(x - 2) = b$, we get $(x - a)^2 = 3$, then $a + b =$

A) 9

B) 3

C) 2

D) 7

E) 5

29) The set of all real values of k, in interval notation, for which the quadratic equation $x^2 - 4x + k = 1$ has **two distinct real solutions** is

A) $(-\infty, 5)$

B) $(-\infty, -5)$

C) $(3, \infty)$

D) $(-\infty, 3)$

E) $(5, \infty)$