10D

Name Solutions

Solving From Vertex Form

Date

Solve each question for the zeros. For #13-16, solve for the x-value that gives the included y-value, then state the coordinates.

1) $y = (x+8)^2 - 4$

$\sqrt{4} = \sqrt{(x+8)^2}$ (+4)

$\pm 2 = x + 8$ (−8, −8)

$\pm 2 - 8 = x$

(+) $x = 2 - 8$

$x = -6$

(−) $x = -2 - 8$

$x = -10$

2) $y = \frac{1}{3}(x-6)^2 + 8$

above x-axis and goes up

$-8 = \frac{1}{3}(x-6)^2$

$\sqrt{-24} = \sqrt{(x-6)^2}$

Cannot square root negatives

∴ no solutions

3) $y = -5(x+8)^2 + 3$

$-3 = -5(x+8)^2$ (−3, −5)

$\sqrt{0.6} = \sqrt{(x+8)^2}$

$\pm 0.77 = x + 8$

$\pm 0.77 - 8 = x$

(+) $x = 0.77 - 8$

$x = 7.23$

(−) $x = -0.77 - 8$

$x = -8.77$

4) $y = -6(x+2)^2 + 3$

$-3 = -6(x+2)^2$ (−3, −6)

$\sqrt{0.5} = \sqrt{(x+2)^2}$

$\pm 0.25 = x + 2$

$\pm 0.25 - 2 = x$

(+) $x = 0.25 - 2$

$x = -1.75$

(−) $x = -0.25 - 2$

$x = -2.25$

5) $y = 2(x-9)^2 - 10$

$+10 \quad +10$

$10 = 2(x-9)^2$

$5 = (x-9)^2$

$\pm 2.23 = x - 9$

$\pm 2.23 + 9 = x$

(+) $x = 2.23 + 9$

$x = 11.23$

(−) $x = -2.23 + 9$

$x = 6.77$

6) $y = (x-1)^2$

$0 = x - 1$

$1 = x$

7) $y = -(x+1)^2 + 8$

$-8 = -(x+1)^2$

$\sqrt{8} = \sqrt{(x+1)^2}$

$\pm 2.83 = x + 1$

$\pm 2.83 - 1 = x$

(+) $x = 2.83 - 1$

$x = 1.83$

(−) $x = -2.83 - 1$

$x = -3.83$

8) $0 = 2(x+1)^2 + 8$

$-8 \quad -8$

$\sqrt{-8} = \sqrt{2(x+1)^2}$

No Solutions

9) $y = -\frac{3}{4}(x+7)^2 + 3$

$-3 = \frac{-3}{4}(x+7)^2$ multiply by $\frac{-4}{3}$

$4 = (x+7)^2$

$\pm 2 = x+7$

$\pm 2 - 7 = x$

(+) $x = 2 - 7$

$x = -5$

(−) $x = -2 - 7$

$x = -9$

10) $y = -\frac{1}{18}(x+4)^2 + 3$

$-3 = \frac{-1}{18}(x+4)^2$ $\times -18$

$\sqrt{54} = \sqrt{(x+2)^2}$

$\pm 7.35 = x+2$

$\pm 7.35 - 2 = x$

(+) $x = 7.35 - 2$

$x = 5.35$

(−) $x = -7.35 - 2$

$x = -9.35$

11) $y = x^2 - 5$

$\sqrt{5} = \sqrt{x^2}$

$\pm 2.24 = x$

$x = 2.24$

$x = -2.24$

12) $y = 2(x+3)^2 - 8$

$8 = 2(x+3)^2$

$4 = (x+3)^2$

$\pm 2 = x+3$

$\pm 2 - 3 = x$

(+) $x = 2 - 3$

$x = -1$

(−) $x = -2 - 3$

$x = -5$

13) $9 = 2(x+7)^2 + 1$

$8 = 2(x+7)^2$

$4 = (x+7)^2$

$\pm 2 = x+7$

$\pm 2 - 7 = x$

(+) $x = 2 - 7$

$x = -5 \rightarrow (-5, 9)$

(−) $x = -2 - 7$

$x = -9 \rightarrow (-9, 9)$

14) $26 = -3(x-10)^2 + 8$

$18 = -3(x-10)^2$

$\sqrt{-6} = \sqrt{(x-10)^2}$

No solution.

This parabola can never equal 26

15) $10 = -4(x-7)^2 + 9$

$1 = -4(x-7)^2$

$\sqrt{-0.25} = \sqrt{(x-7)^2}$

No solutions

16) $-14 = -\frac{4}{5}(x+2)^2 - 6$

$-8 = -\frac{4}{5}(x+2)^2$ multiply by $\frac{-5}{4}$

$\sqrt{10} = \sqrt{(x+2)^2}$

$\pm 3.16 = x+2$

$\pm 3.16 - 2 = x$

(+) $x = 3.16 - 2$

$x = 1.16$

(−) $x = -3.16 - 2$

$x = -5.16$

Math 10D

Name_____

Solving By Factoring

Date_____

Solve each equation by factoring.

1) $n^2 - 6n - 7 = 0$

m: -7
A: -6
+1, -7

$(n+1)(n-7)=0$

$n=-1 \quad n=7.$

2) $8v^2 - 36v + 16 = 0$

$\frac{8v^2 - 36v + 16 = 0}{4}$

m: 8 A: -9
-1, -8

$2v^2 - 9v + 4 = 0$

$2v^2 - 1v - 8v + 4 = 0$

v -4

$v(2v-1) - 4(2v-1) = 0$

$(2v-1)(v-4)=0$

$v=\frac{1}{2} \quad v=4$

3) $3b^2 + 13b + 4 = 0$

m: 12 A: 13
1, 12

$3b^2 + 1b + 12b + 4 = 0$

6 +4

$b(3b+1) + 4(3b+1) = 0$

$(3b+1)(b+4)=0$

$b=\frac{-1}{3} \quad b=-4$

4) $8x^2 - 32x + 22 = -2$

+2 +2

$8x^2 - 32x + 24 = 0$

8

m: 3 A: -4
-1, -3

$x^2 - 4x + 3 = 0$

$(x-1)(x-3)=0$

$x=1, \quad x=3$

5) $3n^2 - 8n - 27 = 8$

-8 -8

m: -105
A: -8
+7, -15

$3n^2 - 8n - 35 = 0$

$3n^2 + 7n - 15n - 35 = 0$

n -5

$n(3n+7) - 5(3n+7) = 0$

$(3n+7)(n-5)=0$

$n=\frac{-7}{3} \quad n=5$

6) $a^2 + 12a = -36$

$a^2 + 12a + 36 = 0$

$(a+6)(a+6)=0$

$a=-6$

7) $5k^2 = 4 + k$

$5k^2 - k - 4 = 0$

m: -20, A: -1, +4, -5

$5k^2 + 4k - 5k - 4 = 0$

$k(5k+4) - 1(5k+4) = 0$

$(5k+4)(k-1) = 0$

$k = \frac{-4}{5}$ $k = 1$

8) $5x^2 - 61x + 168 = 5x - x^2$

$+x^2$ $-5x$ $-5x$ $+x^2$

$6x^2 - 66x + 168 = 0$

6

$x^2 - 11x + 28 = 0$

$(x-4)(x-7) = 0$

$x = 4,\ x = 7$

9) $7x^2 = 105 - 14x$

$7x^2 + 14x - 105 = 0$

7

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

$(x-3)(x+5) = 0$

$x = 3,\ x = -5$

10) $4p^2 - 12p - 10 = -p^2 - 1$

$+p^2$ $+1$ $+p^2$ $+1$

$5p^2 - 12p - 9 = 0$

m: -45, A: -12, +3, -15

$5p^2 + 3p - 15p - 9 = 0$

p -3

$p(5p+3) - 3(5p+3) = 0$

$(5p+3)(p-3) = 0$

$p = \frac{-3}{5}$ $p = 3$

11) $28n^2 + 4n - 38 = -6 + 8n^2 - 8n$

$-8n^2$ $+8n$ $+6$

$20n^2 + 12n - 32 = 0$

4

$5n^2 + 3n - 8 = 0$

M: -40, A: 3, -5, +8

$5n^2 - 5n + 8n - 8 = 0$

5n +8

$5n(n-1) + 8(n-1) = 0$

$(n-1)(5n+8) = 0$

$n = 1,\ n = -\frac{8}{5}$

12) $14n^2 + 6n = 2 - 2n + 4n^2$

$-4n^2$ $+2n$

$10n^2 + 8n - 2 = 0$

2

$5n^2 + 4n - 1 = 0$

M: -5 A: 4, +1, -5

$5n^2 + 1n - 5n - 1 = 0$

n -1

$n(5n+1) - 1(5n+1) = 0$

$(5n+1)(n-1) = 0$

$n = \frac{-1}{5},\ n = 1$

Math 10D Date_____

Solving Using The Quadratic Formula

Solve each equation with the quadratic formula.

1) $6n^2 + 7n - 55 = 0$

$n = \frac{-7 \pm \sqrt{7^2 - 4(6)(-55)}}{2(6)}$

$n = \frac{-7 \pm \sqrt{49 + 1320}}{12}$

$n = \frac{-7 \pm \sqrt{1369}}{12}$

$n = \frac{-7 \pm 37}{12}$

(+) $n = \frac{-7 + 37}{12}$ $n = \frac{30}{12}$ $n = 2.5$

(−) $n = \frac{-7 - 37}{12}$ $n = \frac{-44}{12}$ $n = -3.6\overline{}$

2) $12k^2 - 11k - 24 = 0$

$k = \frac{11 \pm \sqrt{11^2 - 4(12)(-24)}}{2(12)}$

$k = \frac{11 \pm \sqrt{121 + 1152}}{24}$

$k = \frac{11 \pm \sqrt{1273}}{24}$

$k = \frac{11 \pm 35.7}{24}$

(+) $k = \frac{11 + 35.7}{24}$ $k = 1.95$

(−) $k = \frac{11 - 35.7}{24}$ $k = -1.03$

3) $3p^2 + 5 = 8$ $-8 \quad -8$

$3p^2 + 0p - 3 = 0$

$p = \frac{0 \pm \sqrt{0^2 - 4(3)(-3)}}{2(3)}$

$p = \frac{\pm\sqrt{36}}{6}$

$p = \frac{\pm 6}{6}$

(+) $x = \frac{6}{6}$ $x = 1$

(−) $x = \frac{-6}{6}$ $x = -1$

4) $8p^2 + 5p + 2 = -9$

$8p^2 + 5p + 11 = 0$

$p = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$p = \frac{-5 \pm \sqrt{5^2 - 4(8)(11)}}{2(8)}$

$p = \frac{-5 \pm \sqrt{25 - 352}}{16} = -\#$

$\therefore$ no solution.

5) $9m^2 - 7m = -2$

$9m^2 - 7m + 2 = 0$

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

$m = \frac{7 \pm \sqrt{49 - 72}}{18}$

$m = \frac{7 \pm \sqrt{-23}}{18}$

Cannot $\sqrt{}$ negative

∴ No solution.

6) $8n^2 + 6n = 24$

$8n^2 + 6n - 24 = 0$

$n = \frac{-6 \pm \sqrt{6^2 - 4(8)(-24)}}{2(8)}$

$n = \frac{-6 \pm \sqrt{36 + 768}}{16}$

$n = \frac{-6 \pm 28.4}{16}$

(+) $n = \frac{-6 + 28.4}{16}$ (−) $n = \frac{-6 - 28.4}{16}$

$n = 1.4$ $n = -2.15$

7) $-3x^2 + 5x - 39 = -6x^2 + 11$

$+6x^2$ -11 $+6x^2$ -11

$3x^2 + 5x - 50 = 0$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$x = \frac{-5 \pm \sqrt{5^2 - 4(3)(-50)}}{2(3)}$

$x = \frac{-5 \pm \sqrt{25 + 600}}{6}$

$x = \frac{-5 \pm \sqrt{625}}{6}$

$x = \frac{-5 \pm 25}{6}$

(+) $x = \frac{-5 + 25}{6}$

$x = 3.\overline{3}$

(−) $x = \frac{-5 - 25}{6}$

$x = -5$

8) $15n^2 - 3n - 7 = -6n + 11n^2$

$-11n^2$ $+6n$ $+6n$ $-11n^2$

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

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

$n = \frac{-3 \pm \sqrt{9 + 112}}{8}$

$n = \frac{-3 \pm 11}{8}$

(+) $n = \frac{-3 + 11}{8}$

$n = \frac{8}{8}$

$n = 1$

(−) $n = \frac{-3 - 11}{8}$

$n = \frac{-14}{8}$

$n = -1.75$