

Revision Exercise (Quadratics)

1.

a) (i) $1(x + 3)^2 - 1$

e) (i) $-1(x - \frac{15}{2})^2 + \frac{1}{4}$

i) (i) $20(x + \frac{4}{5})^2 - \frac{49}{5}$

b) (i) $1(x + 4)^2 - 1$

f) (i) $2(x + \frac{13}{4})^2 - \frac{49}{8}$

j) (i) $-10(x - \frac{7}{20})^2 + \frac{289}{40}$

c) (i) $1(x + 1)^2 - 16$

g) (i) $-5(x + \frac{4}{5})^2 + \frac{36}{5}$

d) (i) $1(x + 5)^2 - 1$

h) (i) $16(x - \frac{1}{4})^2 - 4$

1.

a) (ii) $(-3, -1)$; Minimum

e) (ii) $(\frac{15}{2}, \frac{1}{4})$; Maximum

i) (ii) $(-\frac{4}{5}, -\frac{49}{5})$; Minimum

b) (ii) $(-4, -1)$; Minimum

f) (ii) $(-\frac{13}{4}, -\frac{49}{8})$; Minimum

j) (ii) $(\frac{7}{20}, \frac{289}{40})$; Maximum

c) (ii) $(-1, -16)$; Minimum

g) (ii) $(-\frac{4}{5}, \frac{36}{5})$; Maximum

d) (ii) $(-5, -1)$; Minimum

h) (ii) $(\frac{1}{4}, -4)$; Minimum

1.

a) (iii) $c = 8$

c) (iii) $c = -15$

e) (iii) $c = -56$

g) (iii) $c = 4$

i) (iii) $c = 3$

b) (iii) $c = 15$

d) (iii) $c = 24$

f) (iii) $c = 15$

h) (iii) $c = -3$

j) (iii) $c = 6$

1.

a) (iv) $x = -2, -4$

d) (iv) $x = -4, -6$

g) (iv) $x = -2, \frac{2}{5}$

j) (iv) $x = -\frac{1}{2}, \frac{6}{5}$

b) (iv) $x = -3, -5$

e) (iv) $x = 7, 8$

h) (iv) $x = \frac{3}{4}, -\frac{1}{4}$

c) (iv) $x = 3, -5$

f) (iv) $x = -\frac{3}{2}, -5$

i) (iv) $x = -\frac{1}{10}, -\frac{3}{2}$

2.

a) $x^2 - 3x + 2 = 0$

e) $5x^2 + 21x + 4 = 0$

i) $x^2 - (2a + 1)x + a(a + 1) = 0$

b) $x^2 - 5x - 6 = 0$

f) $10x^2 + x = 0$

j) $x^2 - (a + 5)x + 3(a + 2) = 0$

c) $x^2 + 2x - 3 = 0$

g) $25x^2 - 1 = 0$

d) $4x^2 - 3x - 1 = 0$

h) $x^2 - ax + 3a^2 = 0$

3.

a) $x^2 - 5x + 6 = 0$

e) $x^2 - \frac{8}{3}x + \frac{4}{3} = 0$

i) $x^2 - 3kx + 2k^2 = 0$

b) $x^2 + 3x + 2 = 0$

f) $x^2 + x - 12 = 0$

j) $x^2 - (\frac{9k^2+1}{3k})x + 1 = 0$

c) $x^2 - x = 0$

g) $x^2 - \frac{5}{4}x + \frac{3}{8} = 0$

d) $x^2 - 12x + 35 = 0$

h) $x^2 + \frac{3}{20}x - \frac{1}{10} = 0$

4.

a) (i) -8

c) (i) -7

e) (i) $\frac{7}{2}$

g) (i) -1

b) (i) 6

d) (i) -6

f) (i) $-\frac{11}{6}$

h) (i) $-\frac{28}{15}$

4.

a) (ii) 7

c) (ii) 12

e) (ii) -2

g) (ii) $-\frac{3}{4}$

b) (ii) 5

d) (ii) -27

f) (ii) $\frac{1}{2}$

h) (ii) $\frac{1}{3}$

4.

a) (iii) $-\frac{8}{7}$

c) (iii) $-\frac{7}{12}$

e) (iii) $-\frac{7}{4}$

g) (iii) $\frac{4}{3}$

b) (iii) $\frac{6}{5}$

d) (iii) $\frac{2}{9}$

f) (iii) $-\frac{11}{3}$

h) (iii) $-\frac{28}{5}$

4.

a) (iv) $\frac{50}{49}$

c) (iv) $\frac{25}{144}$

e) (iv) $\frac{65}{16}$

g) (iv) $\frac{40}{9}$

b) (iv) $\frac{26}{5}$

d) (iv) $\frac{10}{81}$

f) (iv) $\frac{85}{9}$

h) (iv) $\frac{634}{25}$

4.

a) (v) 50

c) (v) 25

e) (v) $\frac{65}{4}$

g) (v) $\frac{5}{2}$

b) (v) 26

d) (v) 90

f) (v) $\frac{85}{36}$

h) (v) $\frac{634}{225}$

4.

a) (vi) $\frac{50}{7}$

c) (vi) $\frac{25}{12}$

e) (vi) $-\frac{65}{8}$

g) (vi) $-\frac{10}{3}$

b) (vi) $\frac{26}{5}$

d) (vi) $-\frac{10}{3}$

f) (vi) $\frac{85}{18}$

h) (vi) $\frac{634}{75}$

4.

a) (vii) -344

c) (vii) -91

e) (vii) $\frac{511}{8}$

g) (vii) $-\frac{13}{4}$

b) (vii) 126

d) (vii) -702

f) (vii) $-\frac{737}{216}$

h) (vii) $-\frac{15652}{3375}$

4.

a) (viii) $-\frac{344}{7}$

c) (viii) $-\frac{91}{12}$

e) (viii) $-\frac{511}{16}$

g) (viii) $\frac{13}{3}$

b) (viii) $\frac{126}{5}$

d) (viii) 26

f) (viii) $-\frac{737}{108}$

h) (viii) $-\frac{15652}{1125}$

4.

a) (ix) 16

c) (ix) 20

e) (ix) $-\frac{9}{2}$

g) (ix) $\frac{5}{4}$

b) (ix) 0

d) (ix) -20

f) (ix) $\frac{10}{3}$

h) (ix) $\frac{16}{5}$

4.

a) (x) $-\frac{344}{49}$

c) (x) $-\frac{91}{144}$

e) (x) $\frac{511}{32}$

g) (x) $-\frac{52}{9}$

b) (x) $\frac{126}{25}$

d) (x) $-\frac{26}{27}$

f) (x) $-\frac{737}{54}$

h) (x) $-\frac{15652}{375}$

4.

a) (xi) -56

c) (xi) -84

e) (xi) -7

g) (xi) $\frac{3}{4}$

b) (xi) 30

d) (xi) 162

f) (xi) $-\frac{11}{12}$

h) (xi) $-\frac{28}{45}$

4.

a) (xii) $-\frac{26}{5}$

c) (xii) $\frac{5}{2}$

e) (xii) $\frac{17}{4}$

g) (xii) $\frac{26}{5}$

b) (xii) $\frac{58}{21}$

d) (xii) $-\frac{74}{35}$

f) (xii) $\frac{109}{30}$

h) (xii) $\frac{754}{135}$

4.

a) (xiii) 350

c) (xiii) 300

e) (xiii) $-\frac{65}{2}$

g) (xiii) $-\frac{15}{8}$

b) (xiii) 130

d) (xiii) -2430

f) (xiii) $\frac{85}{72}$

h) (xiii) $\frac{634}{375}$

4.

a) (xiv) $\frac{10}{7}$

c) (xiv) $\frac{5}{12}$

e) (xiv) $-\frac{13}{8}$

g) (xiv) $-\frac{2}{3}$

b) (xiv) $\frac{26}{25}$

d) (xiv) $-\frac{2}{3}$

f) (xiv) $\frac{17}{18}$

h) (xiv) $\frac{634}{375}$

4.

a) (xv) 88

c) (xv) 130

e) (xv) $-\frac{55}{2}$

g) (xv) $-\frac{11}{4}$

b) (xv) 28

d) (xv) -224

f) (xv) 11

h) (xv) $\frac{48}{5}$

4.

a) (xvi) 400

c) (xvi) 247

e) (xvi) $-\frac{495}{8}$

g) (xvi) $\frac{49}{16}$

b) (xvi) -96

d) (xvi) 1404

f) (xvi) $\frac{899}{216}$

h) (xvi) $\frac{17152}{3375}$

5.

a) (i) $x^2 - 37x + 36 = 0$

b) (i) $x^2 - 17x + 16 = 0$

c) (i) $x^2 - 65x + 64 = 0$

d) (i) $x^2 - \frac{73}{4}x + 36 = 0$

e) (i) $x^2 - 41x + 400 = 0$

f) (i) $x^2 - \frac{205}{36}x + \frac{49}{36} = 0$

g) (i) $x^2 - \frac{109}{4}x + \frac{225}{4} = 0$

h) (i) $x^2 - \frac{29}{400}x + \frac{1}{1600} = 0$

5.

a) (ii) $x^2 + \frac{7}{2}x + \frac{3}{2} = 0$

b) (ii) $x^2 + \frac{15}{4}x + \frac{9}{4} = 0$

c) (ii) $x^2 + \frac{21}{8}x - \frac{9}{8} = 0$

d) (ii) $x^2 + \frac{11}{4}x + \frac{3}{2} = 0$

e) (ii) $x^2 - \frac{27}{20}x + \frac{9}{20} = 0$

f) (ii) $x^2 - \frac{51}{7}x + \frac{54}{7} = 0$

g) (ii) $x^2 - \frac{7}{5}x - \frac{6}{5} = 0$

h) (ii) $x^2 + 42x + 360 = 0$

5.

a) (iii) $x^2 + x - 6 = 0$

b) (iii) $x^2 - x - 2 = 0$

c) (iii) $x^2 - 13x + 22 = 0$

d) (iii) $x^2 - \frac{1}{2}x - \frac{3}{2} = 0$

e) (iii) $x^2 - 15x + 56 = 0$

f) (iii) $x^2 - \frac{53}{6}x + \frac{56}{3} = 0$

g) (iii) $x^2 - \frac{5}{2}x - 9 = 0$

h) (iii) $x^2 - \frac{113}{20}x + \frac{319}{40} = 0$

5.

a) (iv) $x^2 + 17x + 66 = 0$

b) (iv) $x^2 + 15x + 54 = 0$

c) (iv) $x^2 + 3x - 18 = 0$

d) (iv) $x^2 + \frac{31}{2}x + \frac{117}{2} = 0$

e) (iv) $x^2 + x = 0$

f) (iv) $x^2 + \frac{43}{6}x + 12 = 0$

g) (iv) $x^2 + \frac{27}{2}x + 35 = 0$

h) (iv) $x^2 + \frac{207}{20}x + \frac{1071}{40} = 0$

5.

a) (v) $x^2 - \frac{37}{6}x + 1 = 0$

b) (v) $x^2 - \frac{17}{4}x + 1 = 0$

c) (v) $x^2 + \frac{65}{8}x + 1 = 0$

d) (v) $x^2 - \frac{73}{24}x + 1 = 0$

e) (v) $x^2 - \frac{41}{20}x + 1 = 0$

f) (v) $x^2 - \frac{205}{42}x + 1 = 0$

g) (v) $x^2 + \frac{109}{30}x + 1 = 0$

h) (v) $x^2 - \frac{29}{10}x + 1 = 0$

5.

a) (vi) $x^2 - 45x + 200 = 0$

b) (vi) $x^2 - 25x + 100 = 0$

c) (vi) $x^2 - 73x + 340 = 0$

d) (vi) $x^2 - \frac{105}{4}x + 125 = 0$

e) (vi) $x^2 - 49x + 580 = 0$

f) (vi) $x^2 - \frac{493}{36}x + \frac{1445}{36} = 0$

g) (vi) $x^2 - \frac{141}{4}x + \frac{725}{4} = 0$

h) (vi) $x^2 - \frac{3229}{400}x + \frac{5213}{320} = 0$

5.

a) (vii) $x^2 + 217x + 216 = 0$

b) (vii) $x^2 + 65x + 64 = 0$

c) (vii) $x^2 - 511x - 512 = 0$

d) (vii) $x^2 + \frac{539}{8}x + 216 = 0$

e) (vii) $x^2 - 189x + 8000 = 0$

f) (vii) $x^2 - \frac{2771}{216}x + \frac{343}{216} = 0$

g) (vii) $x^2 + \frac{973}{8}x - \frac{3375}{8} = 0$

h) (vii) $x^2 + \frac{133}{8000}x + \frac{1}{64000} = 0$

5.

a) (viii) $x^2 + \frac{217}{6}x + 6 = 0$

d) (viii) $x^2 + \frac{539}{48}x + 6 = 0$

g) (viii) $x^2 - \frac{973}{60}x - \frac{15}{2} = 0$

b) (viii) $x^2 + \frac{65}{4}x + 4 = 0$

e) (viii) $x^2 - \frac{189}{20}x + 20 = 0$

h) (viii) $x^2 + \frac{133}{200}x + \frac{1}{40} = 0$

c) (viii) $x^2 + \frac{511}{8}x - 8 = 0$

f) (viii) $x^2 - \frac{2771}{252}x + \frac{7}{6} = 0$

5.

a) (ix) $x^2 - \frac{259}{36}x + \frac{49}{36} = 0$

d) (ix) $x^2 - \frac{511}{144}x + \frac{49}{36} = 0$

g) (ix) $x^2 - \frac{763}{225}x + \frac{196}{225} = 0$

b) (ix) $x^2 - \frac{119}{16}x + \frac{49}{16} = 0$

e) (ix) $x^2 - \frac{287}{400}x + \frac{49}{400} = 0$

h) (ix) $x^2 - 812x + 78400 = 0$

c) (ix) $x^2 - \frac{455}{64}x + \frac{49}{64} = 0$

f) (ix) $x^2 - \frac{205}{7}x + 36 = 0$

5.

a) (x) $x^2 - 30x - 175 = 0$

d) (x) $x^2 - \frac{51}{4}x - \frac{203}{8} = 0$

g) (x) $x^2 - \frac{95}{4}x - \frac{583}{8} = 0$

b) (x) $x^2 - 12x - 45 = 0$

e) (x) $x^2 - 50x + 609 = 0$

h) (x) $x^2 + \frac{111}{400}x + \frac{9}{1000} = 0$

c) (x) $x^2 - 72x + 567 = 0$

f) (x) $x^2 - \frac{307}{36}x + \frac{3317}{216} = 0$

5.

a) (xi) $x^2 + \frac{9}{14}x + \frac{1}{14} = 0$

d) (xi) $x^2 + \frac{3}{5}x + \frac{2}{25} = 0$

g) (xi) $x^2 - \frac{11}{6}x - \frac{1}{3} = 0$

b) (xi) $x^2 + \frac{7}{10}x + \frac{1}{10} = 0$

e) (xi) $x^2 - \frac{7}{12}x + \frac{1}{12} = 0$

h) (xi) $x^2 + \frac{94}{55}x + \frac{8}{11} = 0$

c) (xi) $x^2 + \frac{5}{14}x - \frac{1}{14} = 0$

f) (xi) $x^2 + \frac{5}{4}x - \frac{3}{2} = 0$

5.

a) (xii) $x^2 + 26x + 69 = 0$

d) (xii) $x^2 + 20x + 75 = 0$

g) (xii) $x^2 + 12x - 133 = 0$

b) (xii) $x^2 + 18x + 45 = 0$

e) (xii) $x^2 - 38x + 357 = 0$

h) (xii) $x^2 - \frac{3}{5}x = 0$

c) (xii) $x^2 - 30x - 99 = 0$

f) (xii) $x^2 - \frac{40}{3}x + 31 = 0$

5.

a) (xiii) $x^2 - 30x - 175 = 0$

d) (xiii) $x^2 - \frac{51}{4}x - \frac{203}{8} = 0$

g) (xiii) $x^2 - \frac{95}{4}x - \frac{583}{8} = 0$

b) (xiii) $x^2 - 12x - 45 = 0$

e) (xiii) $x^2 - 50x + 609 = 0$

h) (xiii) $x^2 + \frac{111}{400}x + \frac{9}{1000} = 0$

c) (xiii) $x^2 - 72x + 567 = 0$

f) (xiii) $x^2 - \frac{307}{36}x + \frac{3317}{216} = 0$

5.

a) (xiv) $x^2 - 31x + 259 = 0$

d) (xiv) $x^2 - \frac{59}{2}x + \frac{875}{8} = 0$

g) (xiv) $x^2 - \frac{299}{4}x + \frac{1363}{8} = 0$

b) (xiv) $x^2 - 13x + 85 = 0$

e) (xiv) $x^2 - 351x + 231 = 0$

h) (xiv) $x^2 - \frac{481}{1600}x + \frac{169}{4000} = 0$

c) (xiv) $x^2 - 73x - 455 = 0$

f) (xiv) $x^2 + \frac{137}{36}x - \frac{2225}{216} = 0$

6.

a) $k = 15$. *Root* = -5 .

b) $a = 2$. *Root* = $-\frac{7}{2}$.

c) $p = 17$. *Root* = $-\frac{2}{3}$.

d) $q = 100$. Solutions: $x = -20$ and $x = -5$.

e) $r = \pm 8$.

When $r = 8$, solutions are $x = -1$ and $x = -7$.

When $r = -8$, solutions are $x = 1$ and $x = 7$.

f) $a = 9$.

7.

a) $x = -3, -1, 1, 3$

e) $x = 1, 3$

b) $x = -4, 4$

f) $x = \frac{1}{2}, 2$

c) $x = -\frac{5}{2}, -1, 1, \frac{5}{2}$

g) $x = 9, 16$

d) $x = -2, -\frac{1}{3}, \frac{1}{3}, 2$

h) $x = 4$

8.

a) $x = 0, 2$

e) $x = 0, -3$

b) $x = 0, 2$

f) $x = 1$

c) $x = 2, 3$

g) $x = 0$

d) $x = 2$

h) $x = 1, \frac{1}{2}$