

Section 4.5A

Factor each completely.

1) $15x^3 + 10x^2y$

2) $28yx^2 + 4y^2x$

3) $a^2 + 19a + 90$

4) $k^2 - 16k + 64$

5) $b^2 - 4b - 21$

6) $b^2 - 16b + 63$

7) $k^2 + 3k - 10$

8) $x^2 - 4x + 4$

9) $a^2 - 3a - 10$

10) $x^2 + 18x + 81$

11) $5x^2 - 10x - 15$

12) $2n^2 + 24n + 40$

13) $3n^2 - 6n - 240$

14) $6k^2 - 96k + 384$

15) $5x^2 - 35x - 90$

16) $2x^3 + 22x^2 + 20x$

17) $9x^2 - 16$

18) $4x^2 - 25$

19) $18x^2 - 50$

20) $3n^2 - 3$

21) $n^4 - 9$

22) $25v^4 - 4$

Solve each equation by factoring.

23) $n^2 + 10n + 16 = 0$

24) $n^2 - 8n + 15 = 0$

25) $x^2 - 4x + 5 = 2$

26) $x^2 - 7x - 15 = -7$

27) $5n^2 - 28n - 12 = 0$

28) $7v^2 + 38v + 15 = 0$

29) $2v^2 - 7v + 4 = -2$

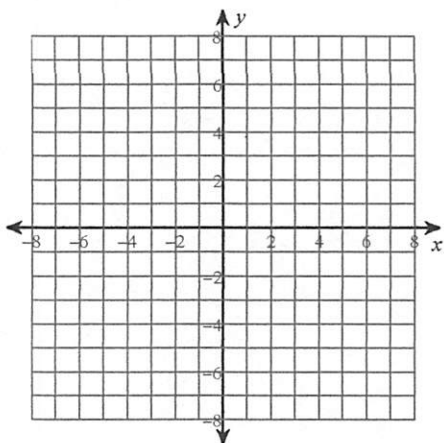
30) $2x^2 + 9x + 7 = 3$

31) $18x^2 - 48x - 14 = 4$

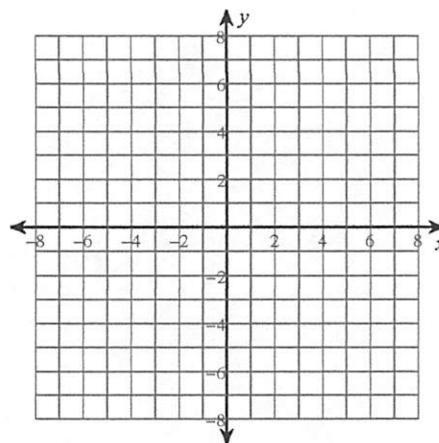
32) $3n^2 - 16n - 57 = 7$

Sketch the graph of each function. State the number of real zeros. Approximate each zero to the nearest tenth.

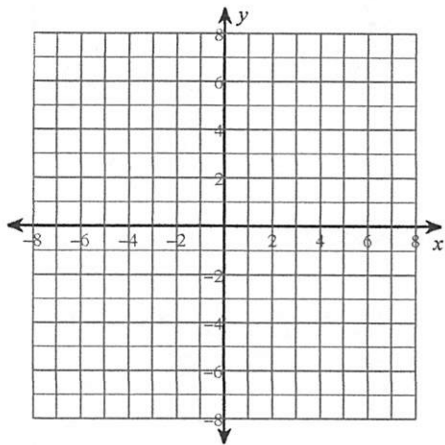
33) $f(x) = x^2 - 4$



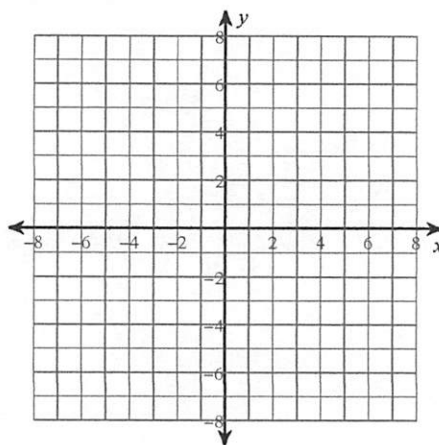
34) $f(x) = x^2 - 6x + 8$



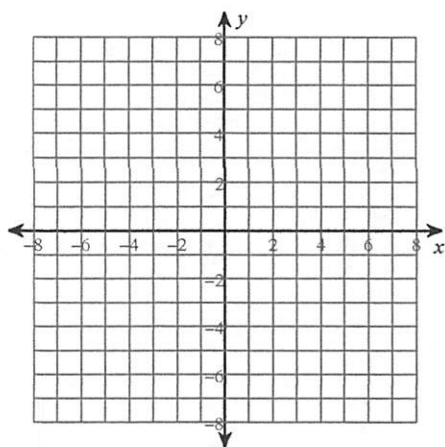
35) $f(x) = x^2 + 2x - 3$



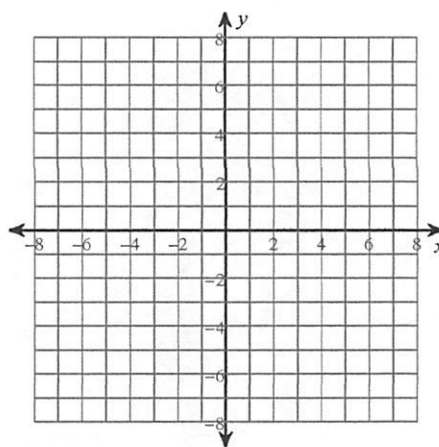
36) $f(x) = 2x^2 + 16x + 30$



37) $f(x) = x^2 + 8x + 12$



38) $f(x) = 2x^2 + 12x + 18$



Section 4.5A

Date _____ Period _____

Factor each completely.

1) $15x^3 + 10x^2y$

$$5x^2(3x + 2y)$$

2) $28yx^2 + 4y^2x$

$$4yx(7x + 4y)$$

3) $a^2 + 19a + 90$

$$(a + 10)(a + 9)$$

4) $k^2 - 16k + 64$

$$(k - 8)^2$$

5) $b^2 - 4b - 21$

$$(b - 7)(b + 3)$$

6) $b^2 - 16b + 63$

$$(b - 9)(b - 7)$$

7) $k^2 + 3k - 10$

$$(k + 5)(k - 2)$$

8) $x^2 - 4x + 4$

$$(x - 2)^2$$

9) $a^2 - 3a - 10$

$$(a - 5)(a + 2)$$

10) $x^2 + 18x + 81$

$$(x + 9)^2$$

11) $5x^2 - 10x - 15$

$$5(x^2 - 2x - 3)$$

$$5(x - 3)(x + 1)$$

12) $2n^2 + 24n + 40$

$$2(n^2 + 12n + 20)$$

$$2(n + 10)(n + 2)$$

13) $3n^2 - 6n - 240$

$$3(n^2 - 2n - 80)$$

$$3(n - 10)(n + 8)$$

14) $6k^2 - 96k + 384$

$$6(k^2 - 16k + 64)$$

$$6(k - 8)^2$$

15) $5x^2 - 35x - 90$

$$5(x^2 - 7x - 18)$$

$$5(x - 9)(x + 2)$$

16) $2x^3 + 22x^2 + 20x$

~~$$2x(x^2 + 11(x + 10))$$~~

$$2x(x + 10)(x + 1)$$

17) $9x^2 - 16$

$$(3x - 4)(3x + 4)$$

18) $4x^2 - 25$

$$(2x - 5)(2x + 5)$$

19) $18x^2 - 50$

$$2(9x^2 - 25)$$
~~$$2(3x - 5)(3x + 5)$$~~

20) $3n^2 - 3$

$$3(n^2 - 1)$$

$$3(n + 1)(n - 1)$$

21) $n^4 - 9$

$$(n^2 - 3)(n^2 + 3)$$

22) $25v^4 - 4$

$$(5v^2 - 2)(5v^2 + 2)$$

Solve each equation by factoring.

23) $n^2 + 10n + 16 = 0$

$$(n + 8)(n + 2) = 0$$

$$n = -2, -8$$

24) $n^2 - 8n + 15 = 0$

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

$$n = 3, 5$$

25) $x^2 - 4x + 5 = 2$

$x^2 - 4x + 3 = 0$
 $(x-3)(x-1) = 0$
 $x = 1, 3$

27) $5n^2 - 28n - 12 = 0$

$(5n+2)(n-6) = 0$
 $n = -\frac{2}{5}, 6$

29) $2v^2 - 7v + 4 = -2$

$2v^2 - 7v + 6 = 0$
 $(2v-3)(v-2) = 0$
 $v = \frac{3}{2}, 2$

31) $18x^2 - 48x - 14 = 4$

$18x^2 - 48x - 18 = 0$
 $2(9x^2 - 24x - 9) = 0$
 $2(3x+1)(3x-9) = 0$
 $x = -\frac{1}{3}, 3$

26) $x^2 - 7x - 15 = -7$

$x^2 - 7x - 8 = 0$
 $(x-8)(x+1) = 0$
 $x = -1, 8$

28) $7v^2 + 38v + 15 = 0$

$(7v+3)(v+5) = 0$
 $v = -\frac{3}{7}, -5$

30) $2x^2 + 9x + 7 = 3$

$2x^2 + 9x + 4 = 0$
 $(2x+1)(x+4) = 0$
 $x = -\frac{1}{2}, -4$

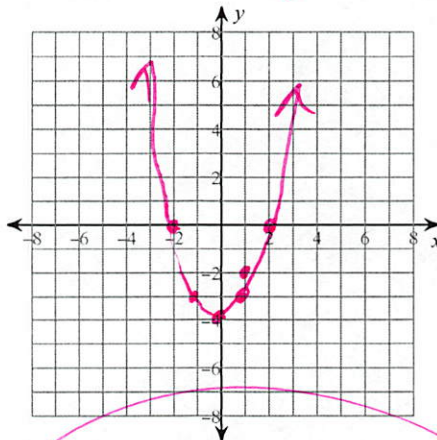
32) $3n^2 - 16n - 57 = 7$

$3n^2 - 16n - 64 = 0$
 $(3n+8)(n-8) = 0$
 $n = -\frac{8}{3}, 8$

$3n+8$
$3n^2 - 8n$
-8
$24n - 64$
192

Sketch the graph of each function. State the number of real zeros. Approximate each zero to the nearest tenth.

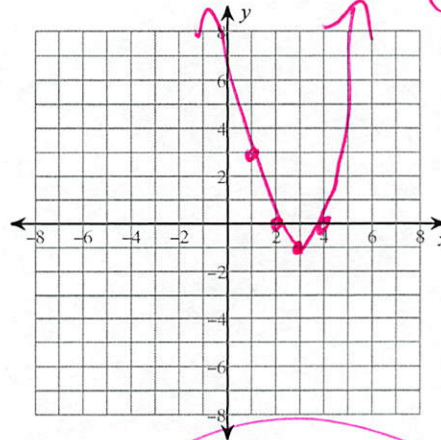
33) $f(x) = x^2 - 4$ $(x+2)(x-2)$



$\begin{array}{r} x \mid y \\ 0 \mid -4 \\ -1 \mid -3 \end{array}$

2 real zeros
 $-2, 2$

34) $f(x) = x^2 - 6x + 8$ $(x-4)(x-2)$

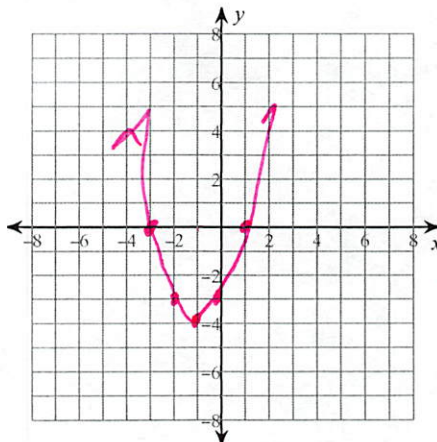


$\begin{array}{r} x \mid y \\ 3 \mid -1 \\ 2 \mid 3 \end{array}$

2 real zeros
 $x = 2, 4$

$9 - 18 + 8$
 $4 - 12 + 8$
 $1 - 6 + 8$

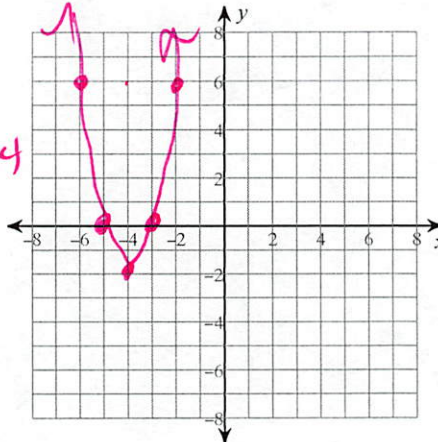
35) $f(x) = x^2 + 2x - 3$



$$\begin{array}{r|l} x & y \\ \hline 0 & -3 \\ -1 & 1 - 2 - 3 = -4 \\ -2 & 4 - 4 - 3 = -3 \end{array}$$

$(x+3)(x-1)$
2 real zeros
1, -3

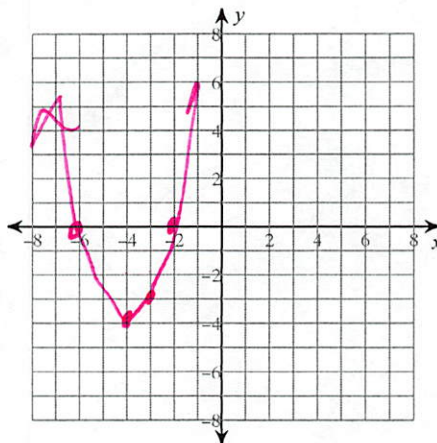
36) $f(x) = 2x^2 + 16x + 30$



$$\begin{array}{r|l} & y \\ \hline -4 & 32 - 64 + 30 = -2 \\ -2 & 8 - 32 + 30 = -2 \end{array}$$

$2(x^2 + 8x + 15)$
 $2(x+5)(x+3)$
2 real zeros
at $x = -3, -5$

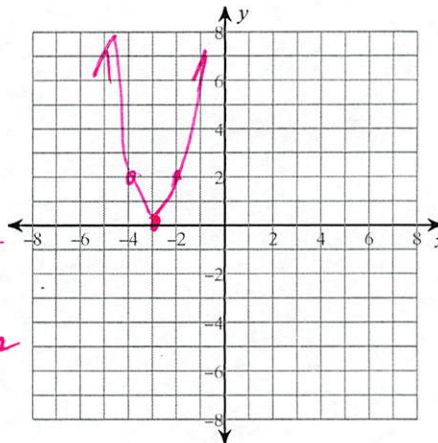
37) $f(x) = x^2 + 8x + 12$



$$\begin{array}{r|l} x & y \\ \hline -3 & 9 - 24 + 12 = -3 \\ -4 & 16 - 32 + 12 = -4 \end{array}$$

$(x+2)(x+6)$
2 real zeros
at -2, -6

38) $f(x) = 2x^2 + 12x + 18$



$$2(x^2 + 6x + 9)$$

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

2 real zeros
2 at -3