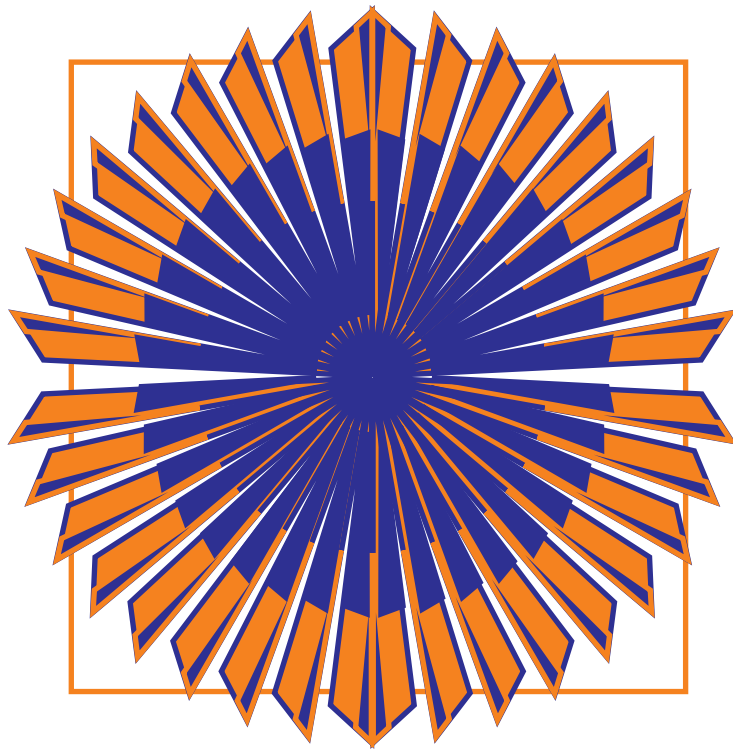


MATHATTACK

ANSWERS



Leading
Educational
Resources

S.J. PESCOTT
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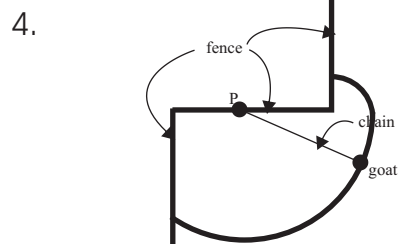
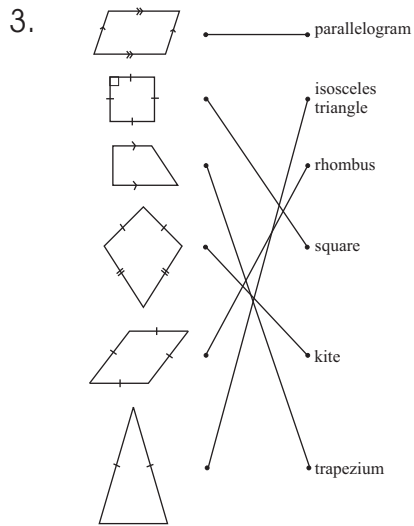
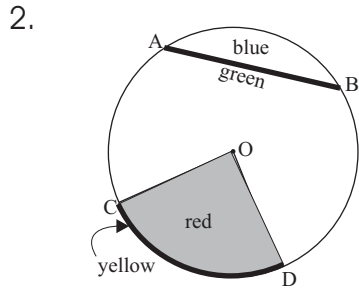
Mathattack 9 Answers

This worksheet is not suited to in-class correction.

1

1. (a) $a = 70^\circ$
 $b = 40^\circ$
 (b) $r = 60^\circ$
 (c) $n = 145^\circ$ (d) $m = 150^\circ$
 (e) $e = 72^\circ$ $f = 108^\circ$
 (f) $a = 125^\circ$ $b = 55^\circ$
 $c = 55^\circ$ $d = 125^\circ$
 (g) $h = 105^\circ$ $j = 75^\circ$
 $k = 105^\circ$
 (h) $g = 160^\circ$ (i) $n = 20^\circ$
 (j) $n = 75^\circ$ $AC = 12$ cm
 (k) $a = 125^\circ$ $b = 55^\circ$
 $c = 125^\circ$
 (l) $f = 100^\circ$ $g = 100^\circ$
 $h = 80^\circ$

2

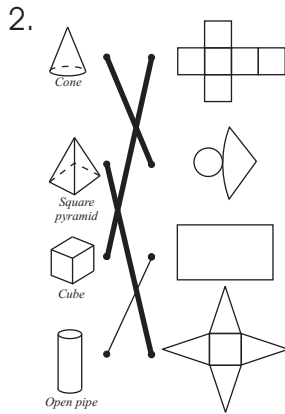


5. (a) $y = 20$
 (b) $x = 9$
 (c) $a = 22$ $b = 35$

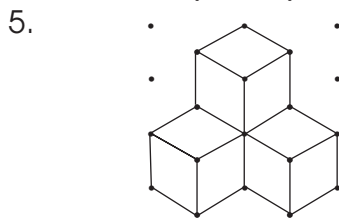
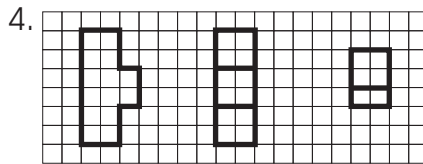
3

1. A&F, E&G, B&D
 3. (a) $c = 4$ cm
 (b) $t = 8$ cm
 (c) $\theta = 92^\circ$
 4. 180 cm
 5. (a) True (b) T (c) T (d) F
 6. (a) A&C (b) B&C
 (c) A&B (d) A&B
 7. (a) $x = 7$ cm
 (b) $a = 4.2$ cm (c) $b = 4.8$ cm
 (c) $x = 20^\circ$ $y = 20^\circ$

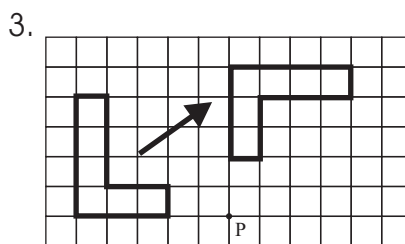
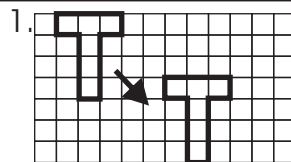
4



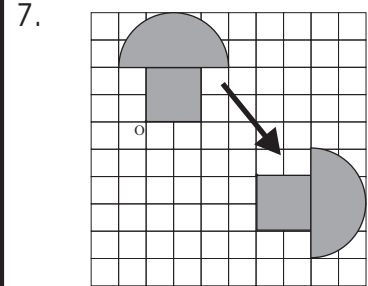
3. 14 vertices, 9 faces and 21 edges. Yes - Euler's formula does work.



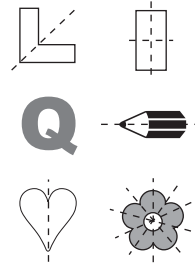
5



4. 9 units right & 2 units down.
 5. A rotation of 180° clockwise about point O.
 6. A reflection about axis AB.



8. (a) 0.5 (b) 3
 9.



6

1.

\times	2	8	4	10	5	12
7	14	56	28	70	35	84
3	6	24	12	30	15	36
11	22	88	44	110	55	132
1	2	8	4	10	5	12
9	18	72	36	90	45	108
6	12	48	24	60	30	72

2. (a) 32, 64, 128
 (b) 129, 257 (c) 47, 95
 (d) E, N, T (Eight, Nine, Ten)
 3. (a) five thousand and one.
 (b) sixty thousand and fifteen.
 (c) three hundred and two thousand, eight hundred and ninety two.
 4. (a) 797 (b) 152 (c) 37 053
 5. $72 = 2 \times 2 \times 2 \times 3 \times 3 = 2^3 \times 3^2$
 6. (a) 14 (b) 2 (c) 50 (d) 0
 (e) 15 (f) 3

1	8	9	3	6	4	1	7	5	6	9
7	1	6	8	9	4	2	0	7		
		10	1	0	4	4	1			
12	1	3	13	6	0	14	6	15	7	2
	9		17	1	2	18	1	3		9
19	9	2	21	7	2	0		23	8	9
24	6	0	25	8	8		26	1	1	2
		27	1	8	8		28	3	5	
29	7	2	30	5	0	0	31	2	9	

Mathattack 9 Answers

7

- (a) $5/13$
(b) $2/8$ or $1/4$
- (a) $1/6$ (b) $1/6$
(c) $1/5$ (d) $2/7$ (e) $3/20$
- (a) $43/8$ (b) $5 \frac{2}{5}$
- $18/30$ and $9/15$
- (a) \$50 (b) 40 kg (c) 640 m
- \$12 000
- (a) $3/7$ (b) $11/12$ (c) $9/8$
(d) $5 \frac{17}{35}$ (e) $16/27$ (f) $1/4$
(g) $8/3$ (h) $1/3$
- (a) $1/3$ (b) $2 \frac{1}{6}$
- (a) $4/5$ (b) 40 hrs
(c) (i) 1200 (ii) 1680
- (a) 0.111 (b) 0.667

11.

Fraction	Decimal	Decimal	Fraction
$\frac{1}{2}$	0.5	0.25	$\frac{1}{4}$
$\frac{3}{5}$	0.6	0.125	$1/8$
$\frac{7}{8}$	0.875	0.3	$3/10$
$2\frac{1}{4}$	2.25	0.55	$11/20$
$3\frac{1}{10}$	3.1	0.3	$1/3$

- (a) $6/7$ (b) $1/12$ (c) $1/2$
(d) 2 (e) $1/2000$
- (a) $7 \frac{7}{12}$ (b) $3 \frac{33}{64}$

8

- (a) 0.383 (b) 8.517
- (a) 3.75 (b) 7.18
(c) 6.003
- (a) $17/100$ (b) $8 \frac{9}{1000}$
(c) $20 \frac{3}{10}$
- (a) 7.83 (b) 0.94 (c) 10.01
(d) 2.00 (e) 87.00 (f) 0.01
- (a) 900 (b) 100 (c) 73 400
(d) 1000
- (a) 16.4 (b) 24.11 (c) 5.69
(d) 28.47 (e) 41.08 (f) 20.01
(g) 131.2 (h) 77.05
- (a) 201.4 (b) 581.2 (c) 760.8
(d) 23.3 (e) 4.5 (f) 131.7
- (a) \$17.50 (b) \$12

9. (a)

centimetres	inches	feet and inches
74	29	2 ft 5 in
185	73	6 ft 1 in
157	62	5 ft 2 in
102	40	3 ft 4 in
15	6	0 ft 6 in

(b) 272 cm

10.

Number	Scientific Notation
8900	8.9×10^3
235 000	2.35×10^5
0.008	8×10^{-3}
0.000 39	3.9×10^{-4}

- 3.84×10^5 km
- 47.9 sec

9

1.

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50
$1/5$	0.2	20
$9/10$	0.9	90
$\frac{1}{8}$	0.125	12.5
$1/100$	0.01	1
$1/200$	0.005	$\frac{1}{2}$
$\frac{1}{3}$	0.3	33 $\frac{1}{3}$
$2/3$	0.6	66 $\frac{2}{3}$

- (a) \$40 (b) 1 m (c) \$600
(d) 60 g
- (a) 25% (b) 20% (c) 2 %
(d) 18% (e) 5% (f) 5%
- 3%
- 15%
- 48
- (a) \$43 470 (b) \$835.96
- antiseptic 75 ml
water 2925 ml
- (a) 2000
(b) Legless lizards 5%
Gold Couch 15%
Cracked Heads 50%
The Rats 30%
- 50%
- Beach ball \$13.50
CD \$25.20
TV \$612
Bike \$234
- \$150
- 30

10

- (a) Moussey \$425
Chip \$225
(b) Moussey \$675
Chip \$575
- (a) 2 537 500
(b) 2 653 409
- Option A \$11 200
Option B \$12 000
Option C \$11700
Option A is best.

4.

	Option A	Option B
After 1 year	\$12 660	\$12 600
After 2 years	\$13 320	\$13 230
After 3 years	\$13 980	\$13 891.50

- 20% increase in x $2x$
20% decrease in x $1.2x$
20% of x $0.2x$
200% of x $0.8x$

- \$400
- \$73 695

11

- (a) 2:1 (b) 2:3
(c) 1:3 (d) 1:2
(e) 1:4 (f) 1:5
(g) 2:5 (h) 1:5 (i) 1:15
(j) 2:5 (k) 1:4
- (a) 1:3 (b) Patrick \$125
Jason \$375
- (a) Soma $2/5$ Elizabeth $3/5$
(b) Soma 800 ha
Elizabeth 1200 ha
(c) \$180 000
- 1:11
- 40 ml
- 20 games
- 5:4
- 1:4
- (a) 160 cm (b) 60 m
- | Time | Scheme 1 | Scheme 2 |
|---------|----------|----------|
| 1 year | \$760 | \$600 |
| 5 years | \$2 840 | \$3 000 |
- (a) 8 caps (b) 15 caps
(c) 48 ml
- Ros \$900 Kerry \$700
- 2 600 birds
- (a) decrease
(b) 490 kangaroos
- Store C

Mathattack 9 Answers

1.

+	1	-8	3	11	-4	7
-6	-5	-14	-3	5	-10	1
2	3	-6	5	13	-2	9
-9	-8	-17	-6	2	-13	-2
12	13	4	15	23	8	19
-5	-4	-13	-2	6	-9	2
10	11	2	13	21	6	17

12

2.

x	-4	12	-1	6	-3	-10
7	-28	84	-7	42	-21	-70
-11	44	-132	11	-66	33	110
8	-32	96	-8	48	-24	-80
2	-8	24	-2	12	-6	-20
9	-36	108	-9	54	-27	-90
-5	20	-60	5	-30	15	50

- (a) -8 (b) 6 (c) -2
- (a) -7 (b) -3 (c) -20 (d) 16 (e) -4 (f) -6 (g) 8 (h) 3 (i) -15 (j) 48 (k) -20 (l) 18 (m) -8 (n) 8 (o) 9 (p) -1 (q) -16 (r) 12
- (a) 3 (b) 4 (c) -3 (d) -1
- 2.11
- (a) -3.5 (b) -3.3 (c) -6.6
- (a) 4 (b) -1 (c) -2 (d) -1 (e) -1 (f) 5
- 2386 yrs
- (a) 373^oK (b) 27^oC (c) 223^oK
- (a) A 18^oC C -8^oC D -2^oC (b) C (c) 26^o

- (a) T (b) F (c) T (d) T (e) T (f) T (g) F (h) T (i) T (j) F (k) T (l) F (m) T (n) T

13

- (a) C (b) C (c) D
3. $\textcircled{3}$ $\textcircled{-2.5}$ π $\textcircled{9}$ $\sqrt{24}$ $\textcircled{\frac{1}{4}}$
- (a) 1.73 (b) 7.07 (c) 7.48 (d) 3.32 (e) 7.68 (f) 0.32 (g) 5.92
- (a) 8 (b) 7 (c) 0.5 (d) 1/6 (e) -9 (f) 9
- (a) 20 (b) 72 (c) 5/4 (d) 8a
- (a) $3\sqrt{5}$ (b) $10\sqrt{10}$
- (a) $4\sqrt{10}$ (b) $50\sqrt{5}$
- (a) $\sqrt{108}$ (b) $\sqrt{28}$ (c) $\sqrt{500}$
- (a) $\sqrt{10}$ (b) $3\sqrt{21}$ (c) $30\sqrt{2}$ (d) $-60\sqrt{2}$
- (a) 3 (b) $\sqrt{2}$ (c) $\sqrt{3/2}$

- (a) $8\sqrt{2}$ (b) $6\sqrt{3}$ (c) $-2\sqrt{5}$ (d) $-\sqrt{5}$ (e) $13\sqrt{2}$ (f) $5\sqrt{5} + 3\sqrt{2}$ (g) $\sqrt{7} + 3\sqrt{3}$ (h) $2\sqrt{7} - 2\sqrt{10}$ (i) $\sqrt{2} + 5\sqrt{3}$
- 4, 9 and 16
PERFECT SQUARES
- 529, 576, 625, 676, 729 and 784

- c, p and AC
- (a) F (b) T (c) T (d) T (e) T (f) F (g) T (h) F
- 90^o
- (a) 13, 84 and 85 (b) 16, 63 and 65 (c) 15, 112 and 113 (d) 18, 80 and 82
- $\textcircled{15}$ 17 21 $\textcircled{36}$ 38 $\textcircled{39}$
- (a) 8.5 (b) 7.4 (c) 9.2 (d) 0.2
- (a) x=6.7cm (b) y= 10.4cm (c) a=15.6 m (d) b=1.1 km
- 11.1 km
- 104.4 m
- (a) 7.1 cm (b) 8.7 cm (c) (i) 12 (ii) 4

14

1.

mm	cm	m	km
3800	380	3.8	0.0038
60	6	0.06	0.00006
500 000	50 000	500	0.5
350	35	0.35	0.00035
58 000	5 800	58	0.058

15

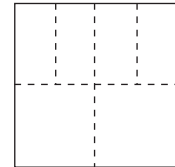
- (a) 6 (b) 153 (c) 7 (d) 170 (e) 5 (f) 20 (all cms)
- (a) 26 cm (b) 16.4 cm (c) 38.6 cm
- (a) 37.7 m (b) 31.4 cm
- (a) 19.3 cm (b) 6.7 m
- B
- (a) 110 cm (b) 10 turns
- (a) 357 m (b) 407 m
- (a) 122 cm (b) 305 yrs
- (a) 550 km (b) 200 km/hr (c) 50 km

- (a) 100 mm² (b) 10 000 cm² (c) 10 000 m² (d) 837 mm² (e) 6.56 cm² (f) 5 600 cm²
- (a) 25 cm² (b) 64 cm² (c) 5.25 m²

16

- (a) 38.5 cm² (b) 15.8 cm²
- (a) 109.9 cm² (b) 30.5 cm²
- (a) B (b) B (c) C
- (a) A=πr² (b) A=(a+b)/2 x h (c) A = 1/2 x h x b (d) A=ab -cd
- (a) A=ab-cd (b) A=f²/2 - πr²
- (a) 720 cm² (b) 20 biscuits (c) 28.3 cm² (d) 154 cm²

- (a) 32 m² (b) 304 cm²
- (a) D (b) B
- b=3 c=5 d=3 e=4 f=3 g=4 h=4
- (a) 24 m² (b) \$840
- (a) 16 m² (b) 4 m (c)



- 25.1 m²
- (a) a=18 cm (b) b=16 cm (b) c=5 cm
- (a) 1810 cm² (b) 690 cm²

17

- (a) 1000 cm³ (b) 1000 litres (c) 1000 mm³ (d) 0.15 litres (e) 75 ml (f) 1.5 litres (g) 8 000 mm³ (h) 50 mm³

18

- C
- 8
- 250 cm³
- B
- 6 000 cm³
- 600 ml
- (a) 20 litres (b) 18 litres (c) 6 fish (d) 10 rocks
- 56.5 m³
- 94 litres
- (a) 15708 m³ (b) 48 m³ (c) 327.3 trucks
- 150.5 cm³
- (a) 8 000 cm³ (b) 4 188.8 cm³
- (a) 1125 (b) 45 (c) 25 hrs

Mathattack 9 Answers

1.

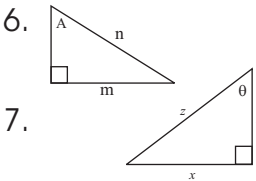
Triangle	Hypotenuse
A	5
B	13
C	z
D	c

19

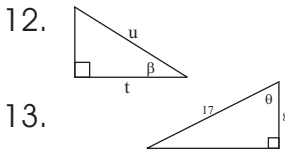
2.

Triangle	Opposite side to θ	Adjacent side to θ	Hypotenuse
A	b	a	c
B	x	y	z
C	k	j	l

3. C
 4. (a) 0.26 (b) 0.89 (c) 1 (d) 0
 5. (a) $3/5$ (b) $5/13$ (c) a/c



7.
 8. $a = b \sin \theta$ $b = a / \sin \theta$
 9. (a) 4.54 m (b) 6.70 mm (c) 13.53 cm
 10. (a) 0.98 (b) 0.14 (c) 1 (d) 0
 11. (a) $8/10$ (b) $24/25$ (c) q/r

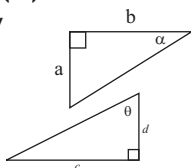


13.
 14. $p = q \cos \theta$ $q = p / \cos \theta$
 15. (a) 4.70 m (b) 4.06 cm (c) 79.95 mm

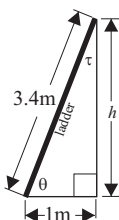
1. (a) 0 (b) 0.21 (c) 1.19 (d) ∞
 2. (a) $3/4$ (b) $9/40$ (c) x/y

20

3.
 4.
 5. $f = g \tan \alpha$ $g = f / \tan \alpha$
 6. (a) 5.60 m (b) 0.17 cm (c) 1.24 m (d) 0.86 mm



7. (a) C (b) B
 8. (a) 37° (b) 18° (c) 75° (d) 48° (e) 90° (f) 0° (g) 0° (h) 6°
 9. (a) 42° (b) 29°
 10. 30°
 11. (a)



- (b) $\theta = 73^\circ$ (c) $\tau = 17^\circ$
 (d) $h = 3.2$ m

1. (a) 18.19 m (b) 4.47 cm (c) 11.01 cm (d) 8.88 cm (e) 38.48 m
 2. 55m
 3. (a) 1.34 m (b) 6.18 m
 4. 572 cm
 5. 11.8 km
 6. 12°
 7. (a) 20.7 cm (b) 17 885 m

21

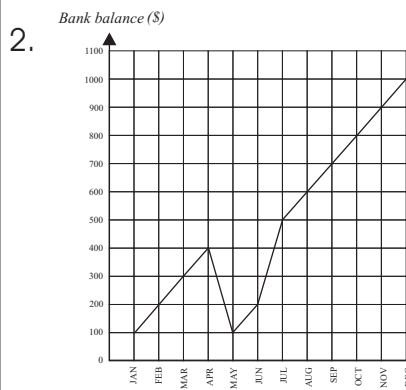
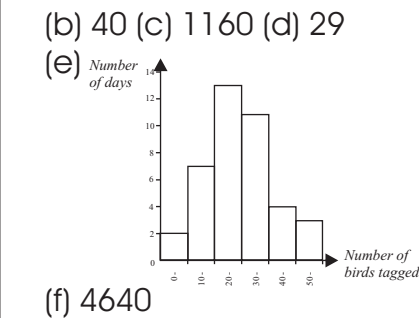
1. (a) A (b) B (c) A (d) C
 2. (a) mean 40 median 41 (b) mean 7.5 median 7
 3. (a) 20 (b) 80 (c) 4 (d) 30%
 4. (a) 125 (b) 88%
 5. (a) HH 120 shots JJ 40 shots (b) Jacqui Jumper More accurate.
 6. (a) 700 (b) 8 and 10 (c) 355 (d) 49%
 7. D
 8. (a) D (b) C (c) A (d) B

22

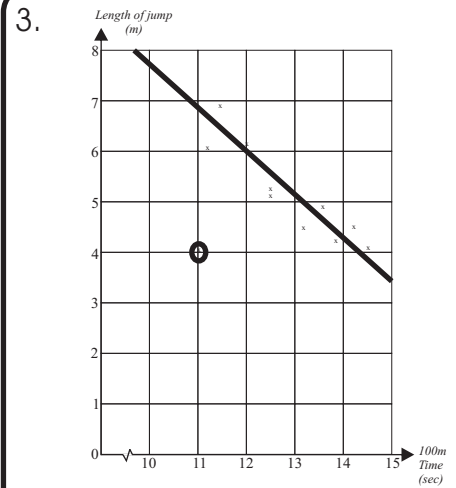
1. (a)

Number tagged	Tally	Frequency
0 -		2
10 -		7
20 -		13
30 -		11
40 -		4
50 -		3
Total		40

23



- (a) May (b) July (c) \$90



- (c) It appears that the faster a person runs, the longer they can broad jump.
 (d) 7.8 m approx.

1. (a) 20°C (b) 36°C (c) 24°C (d) 18°C (e) 6°C (f) 15-36 or 21°
 2. (a) 10 (b) 7°C (c) 30°C (d) no
 3. (a) 28 (b) 15 (c) 25%
 4. (a) Lowest Joe 0 Fred 10 Highest Joe 110 Fred 85 (b) Fred (c) more consistent, better average.

24

5. (a)
- | Stem | Leaf |
|------|-------------------|
| 1 | 8 6 4 3 |
| 2 | 5 1 7 3 2 6 5 8 7 |
| 3 | 1 8 1 1 |
| 4 | 0 1 1 |
- (b)
- | Stem | Leaf |
|------|-------------------|
| 1 | 3 4 6 8 |
| 2 | 1 2 3 5 5 6 7 7 8 |
| 3 | 1 1 1 8 |
| 4 | 0 1 1 |
- (c) (i) 26.9 (ii) 26.5 (iii) 21.5 (iv) 31 (v) 9.5 (vi) 13-41 or 28

- (d)
-
- (e) 10%
 6. (a) 88.5 (b) 88.6 (c) 85
 7. (a) 30 (b) yes

(c)

Stem	Leaf
7	4
7	5 6 8 9
8	0 1 2 3 3 4
8	5 5 5 6 7 9
9	0 2 2 3 3
9	5 6 7 8
10	0 3 4
10	5

Mathattack 9 Answers

1. Discuss.

2. (a) $\frac{3}{8}$ (b) $\frac{4}{15}$
(c) n/x (d) $\frac{5}{6}$
(e) $x/(x+y)$

3. $\frac{1}{40}$

4. (a) A0, A1, A2, A3, A4, A5,
A6, A7, A8, A9, B0, B1
(b) 260

5. (a) $\frac{1}{5}$ (b) BA, BJ, BK, BL, AJ,
AK, AL, JK, JL, KL (c) $\frac{2}{5}$

6. (a) bat, baw, bay, bot, bow,
boy, bet, bew, bey, cat,
caw, cay, cot, cow, coy,
cet, cew, cey, dat, daw,
day, dot, dow, doy, det,
dew, dey

- (b) 27 (c) this may vary
(d) $\frac{19}{27}$ (e) no

- (f) Chance causes.

7. (a) $\frac{3}{20}$ (b) $\frac{1}{20}$ (c) \$4

8. $\frac{1}{32}$

25

1. (a) 3 (b) 16

- (c) $-\frac{1}{2}$ (d) $-\frac{1}{3}$
(e) 1 (f) -1

2. (a) $3x$ $5x^2$ $-x$ $2xy$ $\frac{x}{5}$
(b) $7a$ $2ab$ $-6a^2b$ ab^2 $-\frac{1}{2}ab$

3. (a) $8ab$ (b) $-15xy$ (c) x^2y^3
(d) $6z^2$

4. (a) $3x + 5y$ (b) $7a - 6b$
(c) $2n - 2m$ (d) $-11xy$
(e) $6x - 4$ (f) 0

5. (a) $3x + 6$ (b) $6x - 6y$
(c) $-5x - 35$ (d) $2a - 6$
(e) $m^2 - 3m$ (f) $6t^2 + 10ty$
(g) $6a^2 + 12ab - 15ac$

6. (a) $7x + 16$ (b) $-9m - 12$
(c) $6y - 16$ (d) $-7z$

7. (a)

1st month	2nd month	3rd month	4th month
x	x + 10	x + 20	x + 30

- (b) $(4x + 60)$ dollars

8. (a)

1st month	2nd month	3rd month	4th month
x	2x	4x	8x

- (b) $15x$

9. (a) $x^2 + 5x + 6$ (b) $x^2 - 4x - 5$
(c) $x^2 + x - 12$ (d) $a^2 - 16$

10. (a) $p^2 - 4p + 4$ (b) $m^2 + 6m + 9$
(c) $6a^2 - a - 2$
(d) $4c^2 + 2cd - 2d^2$

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11. (a) $a = x + 2$ $b = x - 4$

- (b) $(4x - 12)$ km
(c) x^2 km²
(d) $(x^2 - 6x + 8)$ km² (e) $6x - 8$

1. (a) 4 (b) m (c) $4x$

- (d) $3p$ or $-3p$

2. Circle (a) and (b)

3. (a) $2(x+2)$ (b) $5(3x-4y)$
(c) $x(6y+1)$ (d) $-3a(8b+9)$
(e) $5x(3+5y-6z)$
(f) $2(2x+4y-5z)$

4. (a) $x(x+3)$ (b) $-2a(a+3b)$
(c) $ab(6a-1)$ (d) $10mn(3m-n)$

- (e) $(x+3)(y+3)$ (f) $(y-3)(x-5)$

5. (a) $(c+1)(b+5)$
(b) $(x-3)(a+5)$
(c) $(m-1)(m+p)$

- (d) $(x+3)(y+3)$ (e) $(2x-3)(x-2)$

6. (a) $(x+5)^2$ (b) $(m+2)^2$
(c) $(p-4)^2$ (d) $(z-1)^2$

7. (a) 9 (b) 36 (c) $10t$ (d) 100
(e) c^2 (f) 1

8. (a) $a^2 - 9$ (b) $x^2 - y^2$

9. (a) $(m+4)(m-4)$
(b) $(z+p)(z-p)$
(c) $(t+3v)(t-3v)$

- (d) $2(d+2)(d-2)$
(e) $(2a+5b)(2a-5b)$
(f) $5(g+10h)(g-10h)$

10. (a) $a^2 + 6a + 8$
(b) $x^2 + 8x + 15$

11. (a) $(x+5)(x+2)$
(b) $(x+5)(x+4)$

1. (a) $\frac{3}{7}$ (b) $\frac{1}{2}$

- (c) $\frac{19}{20}$ (d) $\frac{3x}{7}$
(e) $\frac{2c}{9}$ (f) $\frac{23a}{20}$

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

3. (a) $\frac{(2x+5)}{4}$ (b) $\frac{(3x+4)}{6}$
(c) $\frac{(22x+23)}{20}$
(d) $\frac{(17x+11)}{15}$

4. (a) $\frac{10m}{3}$ (b) $\frac{17d}{4}$

5. (a) $\frac{8}{x}$ (b) $\frac{8}{15p}$ (c) 3
(d) $\frac{(7x-18)}{12x}$

6. (a) $\frac{6}{35}$ (b) $\frac{3}{8}$ (c) $\frac{x^2}{6}$
(d) 6 (e) $\frac{1}{2}$ (f) $\frac{3}{5}$

7. (a) 2 (b) 8 (c) 10 (d) $\frac{1}{9}$
(e) $\frac{2}{5}$ (f) $\frac{5}{2}$ (g) $\frac{3}{2}$ (h) $\frac{1}{2}$

8. (a) $\frac{(x+5)}{2}$ (b) $\frac{(3a-7)}{3}$
(c) $\frac{3}{4}$ (d) $a+3$

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9. (a) $\frac{4}{9}$ (b) $\frac{(m-2)}{2}$ (c) $\frac{5}{3}$
(d) $\frac{2}{3}$ (e) $\frac{6}{7}$ (f) $\frac{3x}{4(x-4)}$
(g) $\frac{2}{3}$ (h) $\frac{4}{5}$

1. (a) 32 (b) 25

- (c) 27 (d) -16
(e) -1 (f) 1

2. (a) 2401 (b) -2197 (c) 187.4
(d) 4096 (e) 4.8 (f) 2.7
(g) 46.3 (h) 2.5 (i) 0.1 (j) 81

3. (a) $12ab$ (b) $12a^3$ (c) $8x^4$
(d) $30m^2n^2$ (e) $-36m^2n$

4. (a) y^5 (b) a^5 (c) $12a^{10}$
(d) $4x^2$ (e) $6x^6y^5$ (f) $3x^6y^4$

5. (a) x^4 (b) y^2 (c) $3x^4$ (d) $3x^2$
(e) $\frac{3x}{2}$ (f) $\frac{4m^2n^4}{3}$

6. (a) 1 (b) 1 (c) 1 (d) 5

7. (a) m^6 (b) $9x^8$ (c) a^{26} (d) t^{12}

8. (a) $x^{10}y^{15}$ $8a^6b^9$ (c) $x^4y^8z^{12}$
(d) a^8 (e) $\frac{x^2}{9y^4}$ (f) $\frac{a^4b^6}{16c^{16}}$

9. $6x^3$

10. (a) x^7y^6 (b) x^3y^{15} (c) $\frac{3a^{10}b^2}{5}$
(d) $6x^3y^3$ (e) $\frac{3x^5y^2}{2}$

11. (a) 73 242 (b) 9hrs

12. (a) 5×10^3 (b) 8.72×10^5
(c) 5.2×10^{-3} (d) 3.09×10^{-4}
(e) 7.5×10^5

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1. (a) $x=4$ (b) $x=\frac{5}{3}$

- (c) $a=5$ (d) $a=-5$
(e) $m=8$ (f) $n=-2$

- (g) $y=12$ (h) $p=-1$ (i) $x=3$
(j) $x=5$ (k) $x=7$ (l) $x=0$

- (m) $x=\frac{1}{4}$ (n) $x=12$

2. (a) $x=5$ (b) $x=-1$ (c) $x=-3$
(d) $x=3$

3. width = 3 km.

4. (a) $\frac{(x-5)}{2} = 30$ (b) $x=65$ yrs

5. $x=40$

6. (a) Naomi $2n$ Greg $n-6$
and Adele $n+3$

- (b) Jullian 16 Naomi 32
Greg 10 Adele 19

7. Container A is 9 litres
Container B is 6 litres

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Mathattack 9 Answers

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- (a) $x \geq 1$
 (b) $-2 \leq x < 0$
 (c) $x > -2$ (d) $-3 < x < 2$
 (e) $x < -2$ (f) $-3 \leq x \leq 2$
 (g) $x \leq 0$
- (a)
 (b)
 (c)
 3. Circle (a) -3, -1, 0 (b) -5, -3
 (c) -2, 0, 1 (d) 2, 3
 4. (a) $s \leq 60$ (b) $8 \leq h \leq 12$
 5. (a) $x \geq 1$ (b) $x \geq -2$ (c) $x > 1/2$
 (d) $x < 1$ (e) $x \geq 4/5$
 6. (a) $x > -4$ (b) $x \leq 2$ (c) $y \geq 0$
 (d) $x > 4 1/2$ (e) $4 < x < 9$

32

- (a) $x=y-z$
 (b) $A=z/3$
 (c) $c=\pm\sqrt{b}$
 (d) $D=B+A$ (e) $A=D-B$
 (f) $x=(y-c)/3$ (g) $u=v-2t$
 (h) $a=(v-u)/t$ (i) $m=E/c^2$
 (j) $c=\pm\sqrt{E/m}$
- (a) $a=2b$ (b) $F=ma$
 (c) $P=V/I$ (d) $P=VI$ (e) $I=k/d^2$
 (f) $F=Blx$ (g) $s=d/t$
- (a) $F=72$ (b) $v=12$ (c) $s=14$
 (d) $F=50$ (e) $p=27$ (f) $z=4$
- (a) $a=30$ (b) $q=5.6$
 (c) $y=\pm 12$ (d) $R=2 1/2$
 (e) $v=\pm 2$

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- (a) $y=6$ (b) $m=9$
 (c) $A=1$
- (a)

P	-3	-2	-1	0	1	2	3
Q	-9	-6	-3	0	3	6	9

 (b)

x	-3	-2	-1	0	1	2	3
y	-13	-10	-7	-4	-1	2	5

 (c)

n	-3	-2	-1	0	1	2	3
m	5	4	3	2	1	0	-1
- (a) $d=2c$ (b) $y=3x-1$
 (c) $w=2v+3$
- | | | | | | |
|---|---|---|----|----|----|
| b | 1 | 2 | 3 | 4 | 5 |
| w | 4 | 7 | 10 | 13 | 16 |

 (a) $w=3b+1$ (b) 61 (c) 7
- | | | | | | | |
|---|---|----|----|----|----|----|
| t | 0 | 1 | 2 | 3 | 4 | 5 |
| d | 0 | 10 | 20 | 30 | 40 | 50 |

 (a) $d=10t$ (b) 1200 m
 (c) 1 min 40 sec

- (a)

t	1	2	3	4	5
c	55	80	105	130	155

 (b) $c=25t+30$ (c) \$230
- (a)

t	1	2	3	4	5
c	30	60	90	120	150

 (b) $c=30t$
- Charge (\$)
 6 hours (\$180)
- (a)

n	1	2	3	4	5
c	70	130	190	250	310

 (b) $c=60n+10$ (c) \$1510
 (d) 12 tickets
- (a) \$50 (b) $c=10n$ (c) 28 m

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- (a)
 (b)

x	-2	-1	0	1	2	3	4
y	-8	-5	-2	1	4	7	10

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- (c)

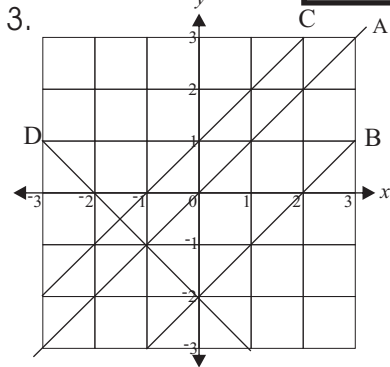
x	-3	-2	-1	0	1	2	3
y	7	6	5	4	3	2	1

 2. (a) B (b) A (c) D
4. (a) ADFG (b) CEH (c) B
 5. (a) C (b) C
 6. 1/2
 7. (a) E (b) B (c) C (d) A & D
 8. (a) 3 (b) -2

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1. A -2 B 0 C 3 D -1

2. C



4. PARALLEL

5. m represents the gradient.
 c represents the y -intercept.

Equation	Gradient	y -intercept
A	3	1
B	-1	4
C	2	5
D	3	0
E	$1/2$	-1
F	0	4
G	-2	6
H	1	0

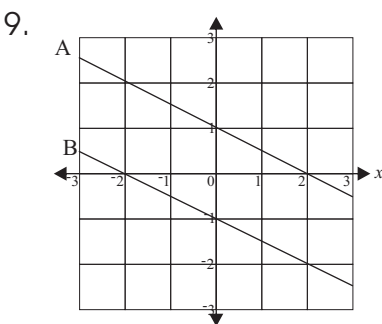
7. A $y=x+3$ B $y=-2x-1$

C $y=-5x$ D $y=x+4$

Equation	Gradient	y -intercept
A	1	3
B	-2	-1
C	-5	0
D	1	4

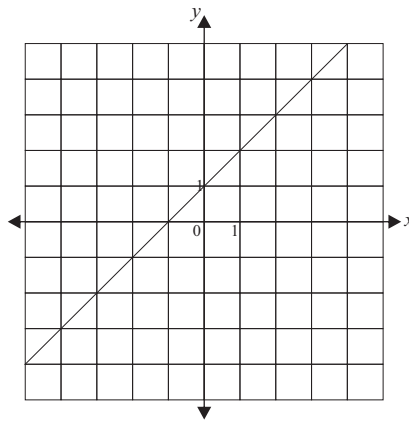
8.

Graph	x -intercept	y -intercept
A	2	3
B	0	0
C	-2	2
D	-3	-1

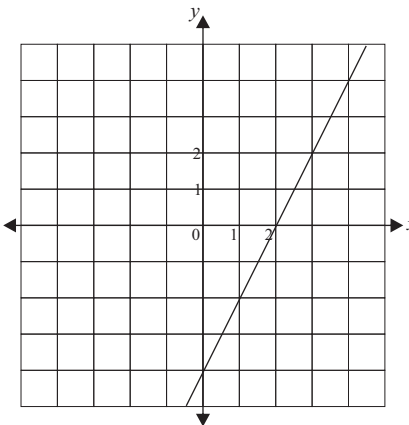


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10. (a) x -intercept = -1
 y -intercept = 1

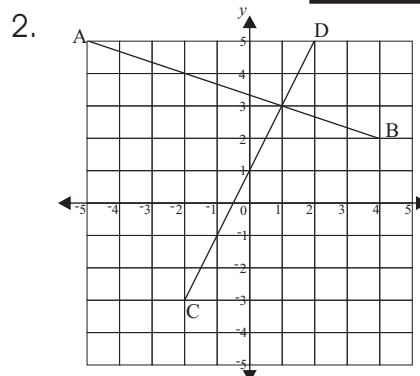


(b) x -intercept = 2
 y -intercept = -4

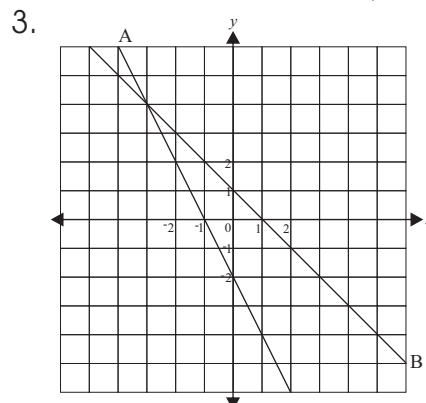


1. (a) (-3, 4)
(b) (0, -2) (c) (4, 2)

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AB and CD intersection (1, 3)



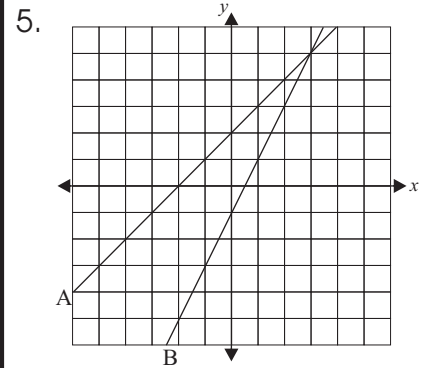
3. (a) (-3, 4) (b) -2 (c) -1 (d) -2
(e) 1 (f) A $y=-2x-2$ B $y=-x+1$

4. A $y=x+2$

x	-2	-1	0	1	2
y	0	1	2	3	4

B $y=2x-1$

x	-2	-1	0	1	2
y	-5	-3	-1	1	3



$x=3$ $y=5$

6. (a) $x=1$ $y=2$ (b) $x=1$ $y=3$

(c) $x=3$ $y=5$

7. (a)

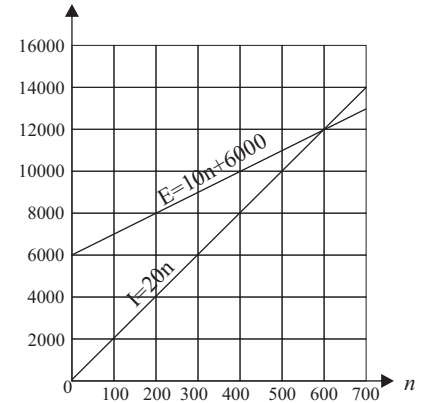
n	0	100	200	300	400
I	0	2000	4000	6000	8000

(b)

n	0	100	200	300	400
E	6000	7000	8000	9000	10 000

(c)

I and E (\$)

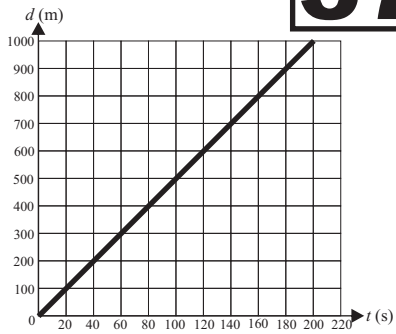


(d) 600 sets

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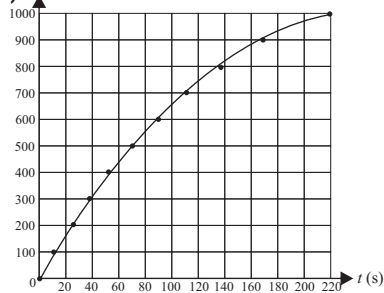
1. (a)

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(b) 1000 m (c) A (d) 5 m/s

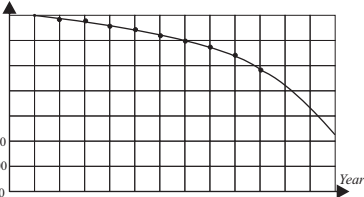
2. (a)



(b) C (c) A (d) 5 m/s
(e) 4.5 m/s

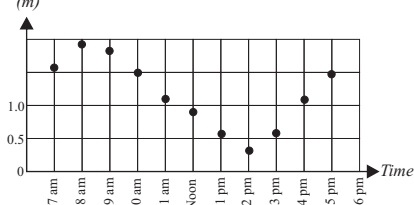
3. (a) I (b) H (c) E (d) F (e) B
(f) C (g) D

4. Population



For year 2002 approx 250.

5. Sea level



(a) 8 am (b) 2 pm (c) 6 hrs

1. A $y = 2x^2$

x	-3	-2	-1	0	1	2	3
y	18	8	2	0	2	8	18

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B $y = x^2 + 9$

x	-3	-2	-1	0	1	2	3
y	18	13	10	9	10	13	18

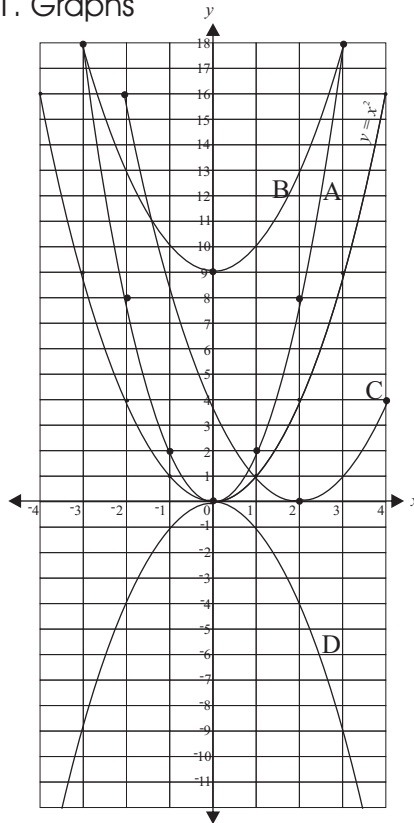
C $y = (x - 2)^2$

x	-2	-1	0	1	2	3	4
y	16	9	4	1	0	1	4

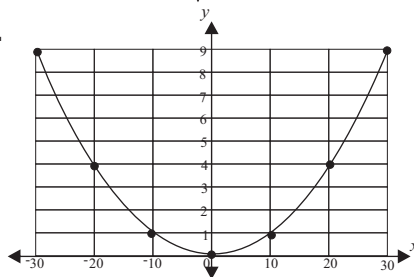
D $y = -x^2$

x	-3	-2	-1	0	1	2	3
y	-9	-4	-1	0	-1	-4	-9

1. Graphs

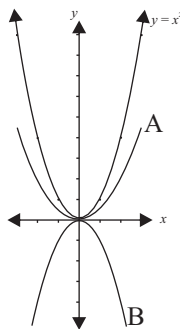


2.



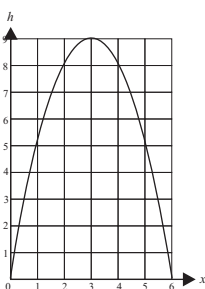
(a) 60 cm (b) 9 cm

3.



4.

x	0	1	2	3	4	5	6
h	0	5	8	9	8	5	0

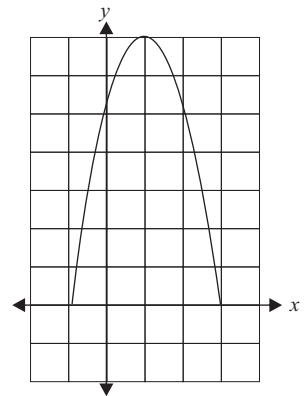


(a) 9 m (b) 6 m

1. (a) 3 (b) 1 and 3
(c) (2, -1) minimum

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2.



TP is a maximum.

3. (a) -4 (b) 4 (c) 0

4. (a) $x(x-3)$ (b) $x(2x-5)$
(c) $3x(x+3)$ (d) $(x+5)(x-5)$
(e) $(x+1/2)(x-1/2)$
(f) $2(x+10)(x-10)$

5. A

6. (a) $x=0$ or 3 (b) $x=0$ or -1
(c) $x=0$ or 5 (d) $x=0$ or $1/2$
(e) $x=0$ or -1 $1/2$

(f) $x = -1$ or 3 (g) $x=4$ or 3

7. (a) $x=0$ or 6 (b) $x=0$ or -2 $1/2$

8. (a) x^2-x-6 (b) $x^2-9x+20$

9. (a) $(x+2)(x+5)$

(b) $(x-2)(x-3)$

10. (a) 8 (b) -4 and -2

(c)

