IGCSE Algebra Practice

Dauntsey's School

Answer on file paper

1: Simplify the following:

a) $y^9 \times y^7$ b) $(a^7)^6$ c) $c^{14} \div c^6$

2: Multiply out and simplify the following:

a) $-6(-9u + 9) + 5(-4u - 9)$ b) $6(-8d + 5) - 10(5d + 4)$ c) $7(7n + 10) + 9(-9n + 9)$

3: Multiply out and simplify the following:

a) $(p + 10)(p - 10)$ b) $(k - 7)(k + 3)$ c) $(t + 5)^2$

4: Multiply out and simplify the following:

a) $(2v + 6)(v - 10)$ b) $(-8w - 6)(w - 6)$ c) $(-2g + 5)(3g - 5)$

5: Factorise the following:

a) $z^2 - z$ b) $l^2 + 2l - 3$ c) $x^2 + 9x + 8$

6: Factorise the following:

a) $8r^2 - 22r + 5$ b) $3m^2 - 4m - 4$ c) $40f^2 + 34f + 3$

7: Simplify the following as far as possible:

a) $\dfrac{s^2 + 7s - 30}{s^2 - 9s + 18} \div \dfrac{s^2 + 5s - 36}{s^2 - 10s + 24}$ b) $\dfrac{e^2 - 3e}{e^2 - 9e} \times \dfrac{e^2 - 16e + 63}{e^2 - 3e - 28}$

8: Solve the following:

a) $2 - 2h = 2$ b) $\dfrac{-q}{5} = -9$ c) $\dfrac{j}{4} - 9 = 1$

d) $b + 1 = -5$ e) $-4 - \dfrac{d}{8} = -7$ f) $10a + 3 = 23$

9: Solve the following:

a) $w + 9 = -6w + 37$ b) $3(k + 7) = -5k - 51$ c) $11n = 6n - 40$

d) $-4(t - 3) - 2(t - 2) = -20$ e) $-2(r - 7) = 4r + 32$ f) $11z - 10 = 8z + 11$

10:

a) l is inversely proportional to the square of m. If $l = 7$ when $m = 4$, find m when $l = 28$

b) y varies as x. If $y = 6$ when $x = 3$, find y when $x = 6$

11: Solve by factorising:

a) $p^2 - 8p = 0$ b) $s^2 + 11s + 30 = 0$ c) $f^2 + 4f - 32 = 0$

12: Solve by factorising:

a) $4v^2 - 1 = 0$ b) $10h^2 + 19h + 6 = 0$ c) $10j^2 - 13j - 3 = 0$

13: Solve using the quadratic formula:

a) $10t^2 - 8t - 9 = 0$ b) $-9k^2 + 5k + 8 = 0$ c) $-6a^2 + 6a - 1 = 0$

14: Solve the following simultaneous equations:

a) $d = n^2$
$d = -3n + 4$

b) $l = c^2$
$l = 9c - 14$

c) $r = w^2$
$r = -9w - 8$

15: Solve the following simultaneous equations:

a) $q = v^2 - v + 5$
$q = -2v + 47$

b) $h = s^2 + s + 9$
$h = 7s + 1$

c) $g = m^2 - 3m - 2$
$g = 4m + 28$

16: Solve the following simultaneous equations:

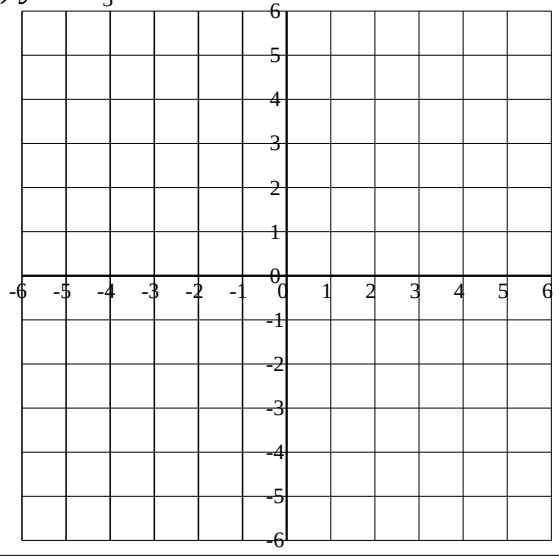
a) $2b + u = 3$
$b^2 + u^2 = 9$

b) $10j + f = 6$
$j^2 + f^2 = 16$

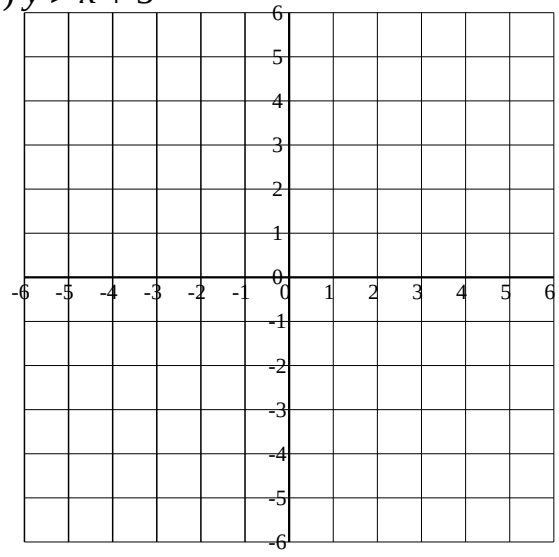
c) $e + 7p = -8$
$e^2 + p^2 = 4$

17: Shade the required region

a) $y \leq -\frac{1}{3}x + 3$



b) $y > x + 5$



Answers: IGCSE Algebra Practice

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1: a) y^{16} b) a^{42} c) c^{8}

2: a) $34u - 99$ b) $-98d - 10$ c) $-32n + 151$

3: a) $p^2 - 100$ b) $k^2 - 4k - 21$ c) $t^2 + 10t + 25$

4: a) $2v^2 - 14v - 60$ b) $-8w^2 + 42w + 36$ c) $-6g^2 + 25g - 25$

5: a) $z(z - 1)$ b) $(l - 1)(l + 3)$ c) $(x + 1)(x + 8)$

6: a) $(2r - 5)(4r - 1)$ b) $(m - 2)(3m + 2)$ c) $(4f + 3)(10f + 1)$

7: a) $\frac{s + 10}{s + 9}$ b) $\frac{e - 3}{e + 4}$

8: a) $h = 0$ b) $q = 45$ c) $j = 40$ d) $b = -6$ e) $d = 24$ f) $a = 2$

9: a) $w = 4$ b) $k = -9$ c) $n = -8$ d) $t = 6$ e) $r = -3$ f) $z = 7$

10: a) 2 b) 12

11: a) $p = 0$, $p = 8$ b) $s = -5$, $s = -6$ c) $f = 4$, $f = -8$

12: a) $v = -\frac{1}{2}$, $v = \frac{1}{2}$ b) $h = -\frac{2}{5}$, $h = -1\frac{1}{2}$ c) $j = 1\frac{1}{2}$, $j = -\frac{1}{5}$

13: a) $t = -0.62956$, $t = 1.42956$ b) $k = 1.26066$, $k = -0.7051$

c) $a = 0.78868$, $a = 0.21132$

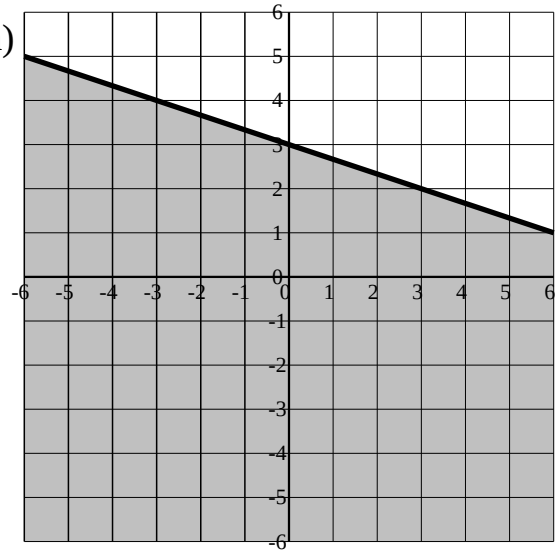
14: a) $n = -4$ and $d = 16$
$n = 1$ and $d = 1$
b) $c = 7$ and $l = 49$
$c = 2$ and $l = 4$
c) $w = -8$ and $r = 64$
$w = -1$ and $r = 1$

15: a) $v = -7$ and $q = 61$
$v = 6$ and $q = 35$
b) $s = 4$ and $h = 29$
$s = 2$ and $h = 15$
c) $m = 10$ and $g = 68$
$m = -3$ and $g = 16$

16: a) $b = 0$ and $u = 3$
$b = 2.4$ and $u = -1.8$
b) $j = 0.2005$ and $f = 3.99497$
$j = 0.98762$ and $f = -3.87616$

c) $e = -1.79267$ and $p = -0.88676$
$e = 1.47267$ and $p = -1.35324$

17: a)



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