

A Level Basics Test: Sample Paper 1

Dauntsey's School

No calculators allowed; please answer on file paper.

Pass mark 75%, or 63 marks out of 84.

Each part of a question is worth 2 marks, except for those in Q4, 13 & 18 which are worth 3 marks.

1: Work out the following:

a) $(-6) \div (-2) - 35 \div (-7)$

b) $(-7) - (-36) \div 4$

2: Work out the following, showing your method and simplifying your answer:

a) $2\frac{3}{4} + 4\frac{2}{3}$

b) $3\frac{2}{9} - 1\frac{3}{10}$

3: Work out the following, showing your method and simplifying your answer:

a) $1\frac{3}{5} \times 1\frac{1}{4}$

b) $1\frac{3}{7} \div 2\frac{1}{2}$

4: Simplify the following:

a) $(3n^9w)^2$

b) $4z^2c^4 \times 5z^4c^{10}$

c) $\frac{12m^{19}b^7}{4m^{10}b^4}$

5: Work out the following:

a) 2^{-2}

b) 6^0

6: Work out the following:

a) $125^{-1/3}$

b) $512^{1/3}$

7: Simplify the following surds:

a) $\sqrt{12} + \sqrt{75}$

b) $\sqrt{112} - \sqrt{7}$

8: Simplify the following surds:

$\frac{8}{\sqrt{5}}$

9: Simplify the following surds:

$(2 - \sqrt{2})^2$

10: Solve the following:

a) $-8x \leq -16$

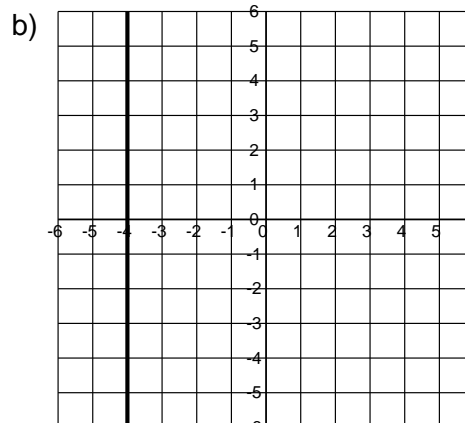
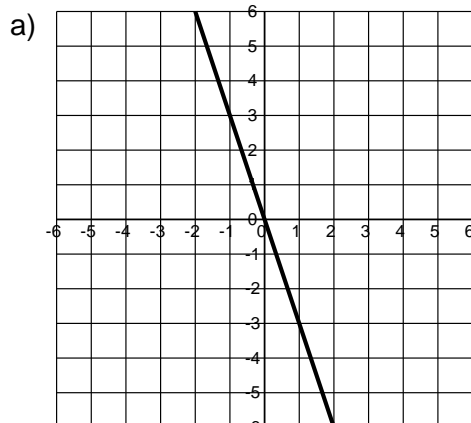
b) $-6(x - 1) > 66$

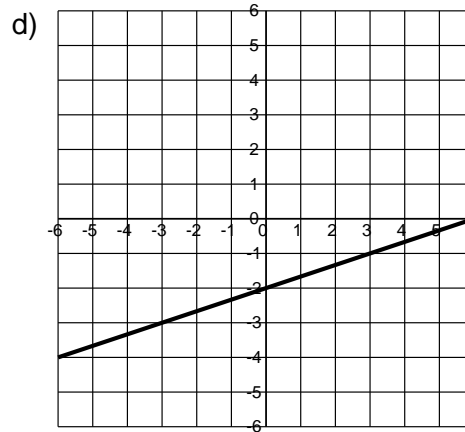
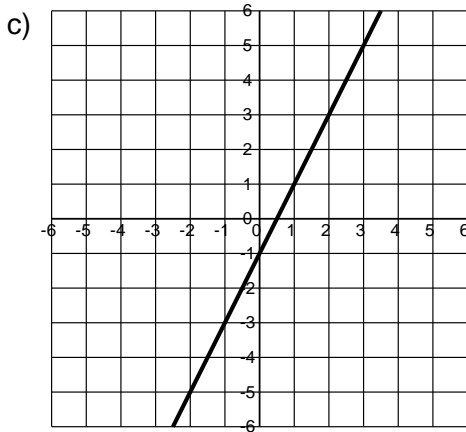
11: Solve the following inequalities:

a) $4x^2 - 15 \geq 309$

b) $2x^2 - 10 < 40$

12: Give an equation for the graph:





13: Work out the following:

- A line segment is drawn between (4, 4) and (6, 1). Find its gradient, mid-point and length.
- A line segment is drawn between (4, 2) and (9, 5). Find its gradient, mid-point and length.

14: Multiply out and simplify the following:

$$(5h - 8)(3h + 4)$$

15: Solve by factorising:

$$a) t^2 - 16t + 60 = 0$$

$$b) g^2 + 7g = 0$$

16: Factorise the following:

$$24s^2 + 11s + 1$$

17: Solve using the quadratic formula, giving your answer in simplified surd form:

$$-y^2 + 9y + 3 = 0$$

18: Solve the following simultaneous equations:

$$x = f^2 - 2f - 16$$

$$x = -f + 4$$

19: Simplify the following as far as possible:

$$a) \frac{60u^2 - 20u}{16u^2 - 48u}$$

$$b) \frac{3r^2 + 9r}{15r}$$

20: Simplify the following as far as possible:

$$a) \frac{a+2}{6} + \frac{a-4}{3}$$

$$b) \frac{v+1}{6} + \frac{v+4}{4}$$

21: Simplify the following as far as possible:

$$a) \frac{3}{5k} \div \frac{10}{9k}$$

$$b) \frac{2}{7j} \times \frac{5j}{6}$$

Answers: A Level Basics Test: Sample Paper 1

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1: a) $3 - (-5) = 8$

b) $(-7) - (-9) = 2$

2: a) $2\frac{9}{12} + 4\frac{8}{12} = 7\frac{5}{12}$

b) $3\frac{20}{90} - 1\frac{27}{90} = 1\frac{83}{90}$

3: a) $\frac{8}{5} \times \frac{5}{4} = \frac{2}{1} \times \frac{1}{1} = \frac{2}{1} = 2$

b) $\frac{10}{7} \div \frac{5}{2} = \frac{10}{7} \times \frac{2}{5} = \frac{2}{7} \times \frac{2}{1} = \frac{4}{7}$

4: a) $9n^{18}w^2$

b) $20z^6c^{14}$

c) $3m^9b^3$

5: a) $\frac{1}{4}$

b) 1

6: a) $\frac{1}{5}$

b) 8

7: a) $7\sqrt{3}$

b) $3\sqrt{7}$

8: $\frac{8\sqrt{5}}{5}$

9: $6 - 4\sqrt{2}$

10: a) $x \geq 2$

b) $x < -10$

11: a) $x \leq -9$ or $x \geq 9$

b) $-5 < x < 5$

12: a) $y = -3x$

b) $x = -4$

c) $y = 2x - 1$

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

13: a) Gradient = $-\frac{3}{2}$
Mid-point = (5, 2.5)
Length = $\sqrt{13}$

b) Gradient = $\frac{3}{5}$
Mid-point = (6.5, 3.5)
Length = $\sqrt{34}$

14: $15h^2 - 4h - 32$

15: a) $t = 6, t = 10$

b) $g = 0, g = -7$

16: $(3s + 1)(8s + 1)$

17: $y = 4\frac{1}{2} \pm \frac{1}{2}\sqrt{93}$

18: $f = -4$ and $x = 8$
 $f = 5$ and $x = -1$

19: a) $\frac{5(3u - 1)}{4(u - 3)}$

b) $\frac{r + 3}{5}$

20: a) $\frac{a + 2}{6} + \frac{2a - 8}{6} = \frac{3a - 6}{6} = \frac{3(a - 2)}{6} = \frac{a - 2}{2}$

b) $\frac{2v + 2}{12} + \frac{3v + 12}{12} = \frac{5v + 14}{12}$

21: a) $\frac{3}{5k} \times \frac{9k}{10} = \frac{27k}{50k} = \frac{27}{50}$

b) $\frac{2}{7j} \times \frac{5j}{6} = \frac{10j}{42j} = \frac{5}{21}$