Pre-Calculus
6.3-6.4 Review Worksheet

Name Answers

Find the component form of $\overrightarrow{AB}$. Then find the magnitude of $\overrightarrow{AB}$.

1. A (2, 4), B (-1, 3)

$\overrightarrow{AB} = \langle -3, -1 \rangle$

$\|\overrightarrow{AB}\| = \sqrt{10}$

2. A (4, -2), B (5, -5)

$\overrightarrow{AB} = \langle 1, -3 \rangle$

$\|\overrightarrow{AB}\| = \sqrt{10}$

3. A (-3, -6), B (8, -1)

$\overrightarrow{AB} = \langle 11, 5 \rangle$

$\|\overrightarrow{AB}\| = \sqrt{146}$

Let v = <2, -1> and w = <-3, 5>. Find u and sketch the vector operations geometrically.

4. u = v + w

$u = \langle -1, 4 \rangle$

5. u = v – w

$u = \langle 5, -6 \rangle$

6. u = 3v

$u = \langle 6, -3 \rangle$

see graphs below

7. u = w – 2v

$u = \langle -7, 7 \rangle$

8. u = 2v + 3w

$u = \langle -5, 13 \rangle$

9. u = 5w – 2v

$u = \langle -19, 27 \rangle$

Find a unit vector for each vector.

10. v = <-3, 4>

$\frac{v}{\|v\|} = \left\langle -\frac{3}{5}, \frac{4}{5} \right\rangle$

11. v = <1, 5>

$\frac{v}{\|v\|} = \left\langle \frac{\sqrt{26}}{26}, \frac{5\sqrt{26}}{26} \right\rangle$

Find the direction angle of each vector.

12. u = 2i – 5j

$\theta = 291.8°$

13. u = -3i - 7j

$\theta = 246.8°$

14. u = 6i – 2j

$\theta = 341.57°$

Find the component form of each vector.

15. || u || = 20, angle = 150°

$\langle -17.32, 10 \rangle$

16. || u || = 10, angle = 315°

$\langle 7.07°, -7.07° \rangle$

Find v · w.

17. v = 5i – 2j, w = -3i + j

-17

18. v = 3i – 9j, w = 2i + j

-3

Find the angle θ between v and w.

19. v = 3i + 2j, w = 7i – 5j

$\theta = 69.2^\circ$

20. v = 2i + 3j, w = 7i – j

$\theta = 64.4^\circ$

21. Find u · v if || u || = 8, || v || = 12, and the angle between u and v is 60˚.

48

22. Find u · v if || u || = 4, || v || = 5, and θ =120˚.

-10

23. Which pairs of vectors are orthogonal?

a. v = <3, -2>, w = <-1, 2>

b. v = <-2, 0>, w = <0, 5>

c. v = <-1, 2>, w = <0, - ½ >

d. v = <2, -3>, w = <-2, 3>

24. Find k so that u and v are orthogonal.

a. u = 3i + 2j
v = 2i – kj

$k = 3$

b. u = -3ki + 5j
v = 2i – 4j

$k = -\frac{10}{3}$

25. Find the projection of u onto v, then find the vector component of u orthogonal to v.

a. u = <-1, 2>, v = <2, -3>

$w_1 = \text{proj}_v u = \left\langle -\frac{16}{13}, \frac{24}{13} \right\rangle$

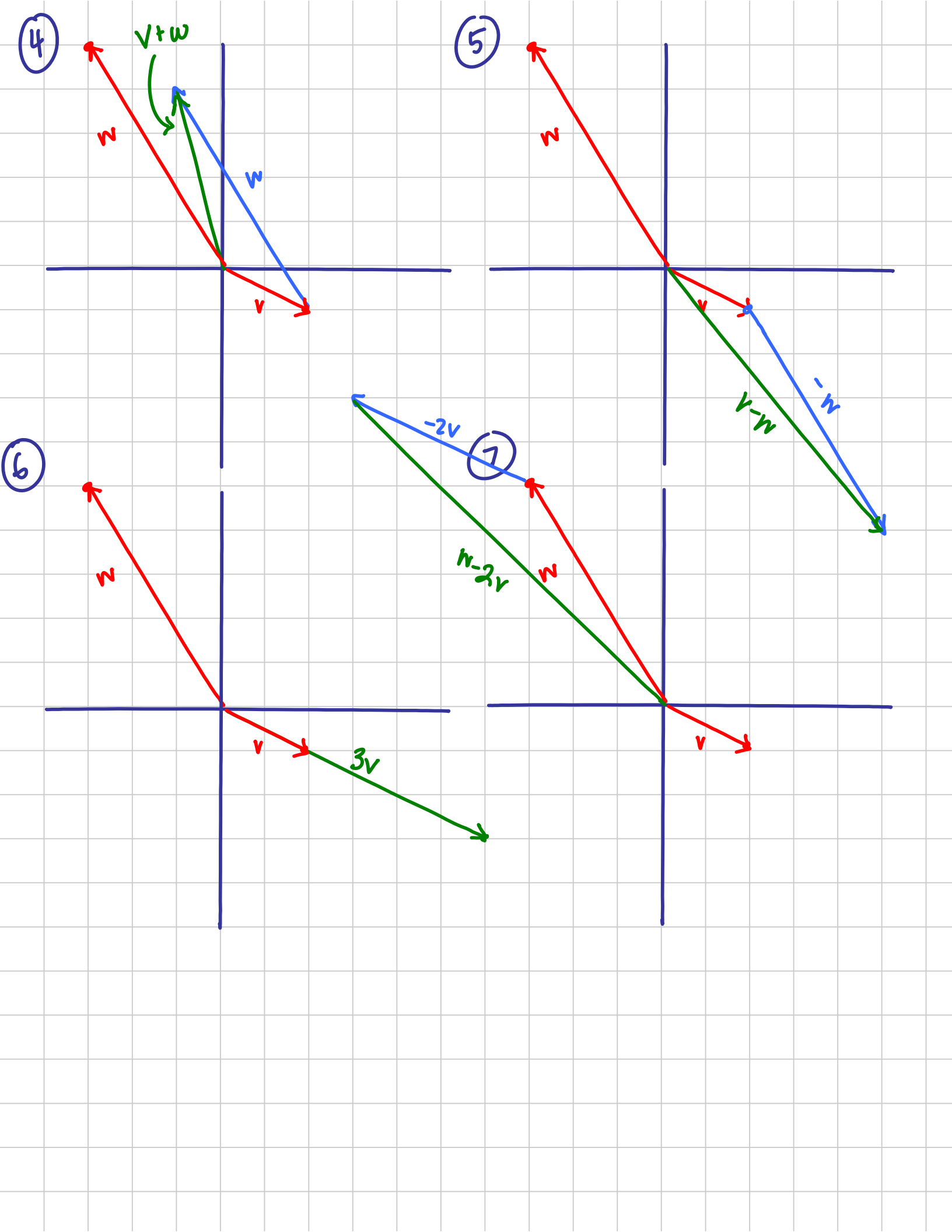
$w_2 = \left\langle \frac{3}{13}, \frac{2}{13} \right\rangle$

b. u = <4, 2>, v = <1, -2>

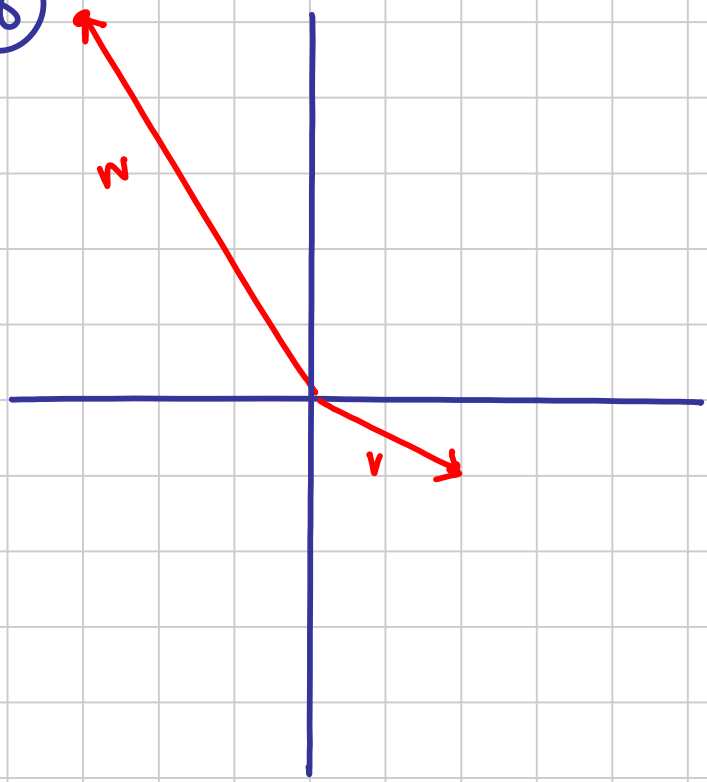
$u \cdot v = 0$

$w_1 = \langle 0, 0 \rangle$

$w_2 = \langle 4, 2 \rangle$


4
v+w
w
w
v
5
w
v
v-w
-w
6
w
v
3v
7
-2v
w-2v
w
v

8



9